**University of Alberta**

# Distance Education in Agriculture Extension: A Needs Assessment for Alberta Agriculture Staff

by

Linda J. Hawk

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment

of the requirements for the degree of Master of Education

in

Adult and Higher Education

Department of Educational Policy Studies

Edmonton, Alberta

Fall 1999

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September 14, 1999

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**Abstract**

This needs assessment study was conducted to identify training and professional development needs for Alberta Agriculture Regional Advisory Services (RAS) staff as they move toward providing education to their clients by distance delivery.

Three approaches were used to collect data – survey, focus group interview, and one-on-one interviews – to gain an understanding of the experience and opinions of RAS specialists about professional development and distance education both qualitatively and quantitatively.

The major findings centered around preferred learning strategies and distance education technologies. Extension specialists identified mentors and secondments as being important professional development strategies. Very few specialists used distance education technologies for learning or teaching, but indicated an interest in learning more about the potential.

The field of distance education is unfamiliar in professional development programming in Alberta Agriculture, Food and Rural Development; however, distance delivery is being used by many large companies and post-secondary institutions. Six conclusions are reached and ten recommendations are made affecting various stakeholders preparing to (a) provide training to their fields using distance delivery methods or (b) assist in the professional development of individuals using distance delivery methods.

**Acknowledgments**

I wish to take this opportunity to express my appreciation to the many people who worked with me to complete this project.

First of all, very special thanks to Dr. Jose da Costa for his tireless energy, encouragement and ideas. His patience and insight were particularly appreciated when progress seemed slow or even non-existent. Thank you as well to the other committee members, Dr. Terry Anderson and Dr. Maryanne Doherty-Poirier for their comments and encouragement.

Without the support of many people from Alberta Agriculture, Food and Rural Development, this project would not have been completed. Thanks in particular to my core committee members and supervisors who kept encouraging me. As well, thank you to Regional Advisory Services for many inspirations both personally and professionally.

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# Chapter 1
# Distance Education in Agriculture Extension: A Needs Assessment for Alberta Agriculture Staff

## *Background*

Since 1905, the Alberta Department of Agriculture has recognized extension work as a key service to agriculture producers in the province. In 1915 the department began to appoint its own agricultural and home economics field staff, and in 1938 the Agricultural Extension Services Branch was formed to coordinate extension activities (Blackburn, 1984).

Traditionally, department extension staff provided education through face-to-face meetings in community halls, at the homes of key producers, and at district offices. Information was disseminated through print-based materials including publications, newspaper articles, radio and television. Since 1973 the department has also offered a distance delivered educational program called Home Study which covers a wide variety of topics. Until very recently, all Home Study programs had been print-based. Some had videotape supplements as an option. The more recent programs, such as Cow-Bytes and Cow-Chips, include computer software.

In 1994, Field Services experienced major changes in structure. Agrologist and home economist positions were replaced with a variety of specialist positions. This change was precipitated by a province-wide consultation process with producers and agriculture businesses. Despite this change, the field services mandate continues to include extension and education, as well as research and consultation.

In addition to changes in structure over the past 93 years, Alberta Agriculture,

Food and Rural Development (AAFRD) has seen technological advancements in all aspects of the industry from family farms to food processing. The technology age is swiftly moving into all aspects of our society, including education.

With the ever changing needs of adult learners, distance delivery is becoming more of a viable option in many industries and learner groups. Increased access to technologies on the farm such as computers, modems, videotape players and satellite television could be utilized by AAFRD staff to provide alternative sources of information and education. "Technological innovations have transformed the field from correspondence study to distance education with the emphasis shifting more to supporting the educational transaction through the use of a range of instructional and delivery methods" (Garrison, 1989, p. 8).

According to Garrison (1989), distance education (DE) is defined by the following three criteria:

1. Distance education implies that the majority of educational communication between (among) teacher and student(s) occurs noncontiguously.
2. Distance education must involve two-way communication between (among) teacher and student(s) for the purpose of facilitating and supporting the educational process.
3. Distance education uses technology to mediate the necessary two-way communication. (p. 6)

In their article "Distance learning and new technologies," Hopey and Ginsberg (1996) indicate that "research has shown that distance education as an 'extend-the-

classroom approach' is one of the more effective ways to provide access to diverse learners who are place bound, bound by distances, or bound by economic efficiencies or policies" (p. 22).

Educators not only have the more traditional technologies such as audio and video tapes, but several computer applications including conferencing, computer-assisted instruction, interactive games and simulations, and the internet.

Even with all of the technology available and the move toward distance education opportunities in many segments of society, the agriculture population has tended to remain fairly traditional in terms of obtaining education and information through recognized institutions such as AAFRD. The reason for this may be the attitudes of extension staff toward using distance education techniques and technologies, the attitudes of the clients, or a combination of the two. There may be other barriers such as lack of knowledge, skills, technology, access or support.

### *Purpose*

The purpose of this research was to identify training and development needs for Alberta Agriculture Regional Advisory Services (RAS) staff as they move toward providing services to clients by distance delivery. The research problem addressed was: What are the professional development needs of Alberta Agriculture Regional Advisory Services staff in developing and facilitating distance education opportunities for customers?

Three sub-questions were also addressed from the perspective of RAS staff:

1. What is the preferred format for professional development programming?

2. Which distance education technologies will best meet their needs for delivering instruction to their clients?
3. What resources are available to RAS staff to provide opportunities for self-directed learning?

## *Significance of the Study*

The evolution of the information age continues to have an impact in the agriculture industry, as well as all aspects of both rural and urban society. In the distance education field, the most important and visible change has been the introduction and adoption of new communications technologies.

This study will provide a basis for the future direction in professional development for Alberta Agriculture staff responsible for the development and delivery of educational opportunities for customers. Provincial specialists and management will have a clearer picture of the knowledge and skill base of RAS specialists in distance education and help to set a direction for professional development and technology training for the next two to three years.

## *Definition of Terms*

### *Distance Education*

Distance education has become the popular term to describe learning via telecommunications - media configurations including radio, telephone, television and computers (Heinich, Molenda, Russell, & Smaldino, 1996). It is generally characterized by the following:

1. Physical separation of learners from the teacher,

2. An organized instructional program,

3. Technological media,

4. Two-way communication.

The popular understanding of distance education is that it includes any one of the above characteristics.

***Technology***

Technology for learning is defined as "an application of technology to aid the learning process, and may refer to either 'hard' technologies (communications media) or 'soft' technologies (processes or procedures that follow a technological approach)" (Heinich, et al., 1996, p. 416).

***Professional Development***

For the purposes of this research, professional development refers to any opportunity for staff to upgrade or improve skills and knowledge in a subject area that is agreed upon by the employee and supervisor. The Alberta Teachers' Association defines professional development as "any planned activity that provides teachers with an opportunity for growth in knowledge, skills and attitudes leading to improved teaching practice" (Alberta Teachers' Association, 1991).

***Education***

According to The Concise Oxford Dictionary (1995), education is defined as "the act or process of educating or being educated; systematic instruction" (p. 431). To educate is "to give intellectual, moral, and social instruction, especially as a formal and prolonged process."

In his book *Understanding and Facilitating Adult Learning* (1986), Stephen Brookfield argues that

> the term education should be reserved for describing the process of managing external conditions that facilitate the internal change called learning. By this definition, an educator would be one who deliberately manages external conditions of instruction in order to produce desired internal mental rearrangements. Hence, an adult who sets learning goals, locates appropriate resources, devises learning strategies, and is responsible for evaluating the progress made toward the attainment of those goals would be engaged in self-education .... (pp. 46-47)

***Extension***

"Extension is a system of non-formal education whose professional practitioners must be well grounded in foundation disciplines as well as dynamic and adaptive to changing practices" (Blackburn, 1989, pg. vii). Boone (1989) further defines extension as:

> a system of nonformal education. As such, it is a field of professional education practice aimed at 1. teaching people, in their own context and life situations, 2. helping them acquire the knowledge and skills required to cope effectively with those needs and problems; and 3. inspiring them to action. (p. 1)

***Summary***

Chapter one gave a brief overview of the history of agriculture extension in AAFRD and described some of the changes in structure that lead to the consideration for

using distance education techniques and technologies for both staff training and client education. To aid with the decision-making process and distribution of resources, this study addresses the question: what are the professional development needs of Alberta Agriculture Regional Advisory Services staff in developing and facilitating distance education opportunities for customers.

The next chapter explores the literature in the areas of extension education, distance education, distance education in agriculture extension and distance education in Alberta Agriculture. This review provides a foundation for the research by describing the issues and considerations for distance education in agriculture extension.

Chapter three describes the research method in more detail. Chapter four presents the findings from the study. These findings are discussed in light of the literature in chapter five. The final chapter combines the literature, research data and analysis of the data to identify conclusions and recommendations for practice and theory.

# Chapter 2
# Literature Review

## *Introduction*

Although there is considerable current research in the fields of distance education and agriculture extension, there is little research that is specific to professional development training for agriculture extension agents with respect to distance education techniques and technologies. The literature review for this study covers the areas of extension education, distance education, distance education in agriculture extension, and distance education in Alberta Agriculture.

## *Extension Education*

Extension education is the process of extending information from research to practice. Traditionally, extension has meant education in agriculture and home economics for rural families. The purpose was to improve farm and home skills through the application of research in science and technology to real life problems (Blackburn, 1994). Rural people are encouraged to participate in the planning and implementation of research projects and educational programming.

### *Historical Perspective*

The Cooperative Extension Service in the United States was created by several acts of legislation. A federal department of agriculture was established in 1862. Realizing that for information to be useful, it had to be disseminated, Congress passed the Morrill Act later the same year. This act provided for the establishment of "Land-grant colleges" which would be responsible for agriculture research and education (Clark, 1966, p. 33). The Smith-Lever Act of 1914 was the first comprehensive legislation relating to

agricultural extension work. "The Agricultural Extension Service of the Land-Grant institutions and the United States Department of Agriculture has been a cooperative endeavor since it's official beginning" (Clark, 1966, p. 33).

The agricultural extension system in Canada is set up much differently than that of the United States. The BNA Act of 1867 defined education as a provincial responsibility. Although the field of rural extension was not specifically mentioned in the Act, it also became defined as a provincial responsibility (Blackburn & Vist, 1984, p. 7). The Alberta Department of Agriculture was established in 1905, and agriculture extension has been an important component of the information and services provided since that time.

***Focus on the Adult Learner***

Boone (1989) describes the following characteristics that distinguish extension education from other forms of adult education:

1. Extension is concerned with helping people meet or solve immediate and long-term needs and problems. Efforts are directed toward individual learners, learner groups and learning systems.
2. Extension education creates and nurtures learning that is immediately valued in the context of the learner's everyday lives.
3. Extension education emphasizes the involvement of learners and their leader representatives in the decision making process as it relates to programs and governance.
4. Extension education programs are planned and sequenced to produce or effect desirable changes in the behavioral patterns of learners.

desirable changes in the behavioral patterns of learners.

5. Extension programs are dictated by the particular uses to which the learning will be put, and, consequently, are closely related to the environment of the learners.
6. Extensions' programs are conducted close to where learners live and work.
7. A variety of resources and technologies are used in programming. Emphasis is on learning rather than teaching and both professionals and volunteers are used as facilitators and teachers.
8. Extensions' publics participate in its program activities on a volunteer basis. (p. 2)

Extension workers pride themselves on their knowledge and understanding of how adults learn, and involve the learner in the educational process. Griffith (1984) says the following about extension workers and their philosophy:

> By involving their intended audience in the process of identifying problems to be solved, by arranging for learner participation in planning, conducting and evaluating programs, by emphasizing the demonstration method and learning by doing, extension workers have performed in ways that are consistent with learning theories and which have been tested in practice. (p. 19)

Extension education is focused on the adult learner. Success in programming is measured by changes in attitude, beliefs or behavior and can be achieved by recognizing the individual's needs, background and ability, and helping the learner use those factors to grow and learn (Coldeway, 1986).

The role of the extension worker and adult educator is to empower learners to identify their needs for a given situation and to seek applicable information and guidance

to solve a given problem or address a specific issue. The educator can achieve this by encouraging and supporting autonomous learning.

McCreary (1989) discusses several aspects of autonomous learning: (a) independent study, (b) self-directed learning, (c) self-learning projects, (d) continuing professional education, and (e) self-organized learning. There are very slight differences in each, ranging from more formal modularized curricula in independent study to complete autonomy for learners in self-organized learning. For many learners, distance delivery is one way to participate in autonomous learning activities, either through an institution or facilitator, or by identifying specific needs and sources and completing self-learning or self-organized projects.

The challenge to today's extension workers is adapting alternative delivery methods to the extension philosophy. Autonomous learning can encompass a wide variety of teaching and learning methods from structured face-to-face programs to print-based or computer-mediated distance delivery. Using alternative delivery methods while preserving a learner-focused programming environment may be a paradigm shift that some extension workers are not yet prepared to make.

### *Distance Education*

The evolution of the information age has had an effect on all aspects of our society from home management to business to education. Technology is fueling rapid change making life-long learning mandatory; it is also providing the instruments and tools to allow learning to occur (Merriam & Caffarella, 1991). Educators not only have the more traditional technologies such as audio and video tape, but many computer

applications including conferencing, computer-assisted instruction and interactive games. The most recent addition to this technological family is the internet.

The potential for technology uses in the education field is phenomenal and growing. Educators are faced with defining the best uses for technology and making decisions on how to combine it with other teaching strategies for well-balanced programs. They need to be aware of the possible and probable uses of technologies so that the educational goals can be achieved (Kussmaul, et al. 1996).

***Historical Perspective***

Distance education has an international history dating back to the mid-1800s (Moore & Kearsely, 1996). It began with print-based correspondence study, which is still the most popular form of distance education. The world's first university distance education program was established at the University of Chicago in 1892. The purpose was to "reach out to learners who were otherwise unprovided for" (pg. 22).

In 1969 the British government established the Open University - a fully autonomous, degree-granting university. The British Open University has been very successful and has served as a model for similar institutions around the world. It is "the best example of a total systems approach to distance education" (Moore & Kearsley, 1996, p. 27). One of the primary missions, which has been adopted by many other universities offering distance education, is "open access to higher education and make it available to anyone who wants it, not just by offering courses at a distance but also by removing other constraints" (Moore & Kearsley, 1996, p. 42). The basic principles of an open university are as follows: (a) anyone can enroll; (b) students can begin at any time;

(c) study is done where ever the learner chooses; (d) materials are developed by experts; (e) tutoring is provided by specialists; and (f) the university is national, enrolls large numbers and enjoys economies of scale (pp. 42-43).

In the 1970s, the British Open University influenced the Canadian distance education scene; however, as early as the early 1900s Canadian universities, such as Queen's, St. Francis Xavier, and the University of Saskatchewan, were offering correspondence courses and off-campus learning opportunities. Athabasca University, Canada's open university, was established in 1970 to provide degree programs in the arts and sciences. In 1973 the Alberta government established the Alberta Educational Communications Corporation (ACCESS) to allow institutions, such as Athabasca University, to deliver instruction via the medium of television (Rothe, 1986).

***Distance Education Technologies***

Although print-based correspondence is still the most widely used distance education technology, open universities are also characterized by their commitment to the use of audio, visual, and computer media to supplement print. "Over the last 25 years, technology has been central to the task of teaching in distance education. The emphasis is on delivery of knowledge to the people at a place and time where it is most accessible" (Kontos, Mizell & Hesser, 1995).

The challenge for educational development and delivery organizations is to make informed and appropriate decisions regarding human, economic, educational and organizational factors related to instructional and learning alternatives (Bates, 1995). Both Shobe (1986) and Bates (1995) outline several factors that the organization must

consider in its decision-making that will determine the success or failure of its programs:

1. What are the relative strengths and weaknesses of the different communication and educational technologies being considered for use?
2. Does the technology meet the current and emerging needs of adult learners in a flexible or open manner?
3. What is the cost and accessability?
4. What are the system and operational requirements for the successful use of technology?
5. What learner support systems are available?
6. How will the evaluation process provide meaningful and constructive measures of success of the program and the use of technologies?
7. What is the institutional commitment?

Through research and experimentation, organizations can make concrete choices for deciding how to use distance technologies that will best meet their needs and the needs of their learners.

***Barriers to Using Distance Delivery***

There are several barriers to using distance delivery and distance education technologies discussed in the literature. These include: (a) lack of educator experience, (b) technology, (c) student motivation, and (d) allocation of time.

***Lack of educator experience.*** Organizing a distance delivered learning opportunity is often more complicated and extensive than for face-to-face delivery. Willis (1993) states that "Adequate training prior to teaching and continuing support throughout

the delivery process are the most effective and efficient methods for ensuring long-term instructional success in distance education" (p. 37). Many educators do not have experience nor training in planning or facilitating distance delivered programs. They may not even have experience as learners in distance environments or in using distance education technologies. It is important that instructors experience hands-on training with the technologies they will be using. The organization must also address the issues of technical support (Martinez & Sweger, 1996).

Hopey and Ginsburg (1996) state that:

> An immediate issue for using the internet is professional development for those who will be using it as an instructional tool. In educational organizations, instructors will need ongoing training in new methods and advanced skills. They will need to change their role from one of teacher in the traditional sense, to a "facilitator, motivator, and validator of knowledge." (p. 23)

***Technology.*** Barriers related to technology refer to the inexperience in using technology and technical difficulties associated with the technology. Techno-phobia is common in today's information society, particularly for adults who have little or no technological experience. Using such applications as voice-mail, e-mail or computerized equipment can be stressful. Ryder and Wilson (1995) believe that techno-phobia is typically triggered when there is a belief in the value or necessity of learning and using a new technology plus the feelings of incompetence or inability to learn it. This can lead to avoidance of technology; however, continued avoidance behavior only serves to widen the knowledge gap leading to further feelings of inadequacy and incompetence (p. 8).

For those learners who grow beyond techno-phobia and are willing to use technologies in learning, they find benefits in the learning process; however, technological difficulties can cause negative experiences. Ridley and Sammour (1996) and Kearsley, Lynch and Wizer (1995) found that students generally agreed that online learning enhanced communication and collaboration; however, they disliked the problems associated with telecommunications hardware and software. Lacina-Gifford and Kher-Durlabhji (1996) found similar results. "Technology-related breakdowns are sure to happen, and there needs to be a plan in place to address them. Learner success is affected by their previous knowledge of and familiarity with telecommunications software along with a working understanding of various protocols" (p. 94).

***Student motivation.*** In the analysis of teaching a course via internet, Lacina-Gifford and Kher-Durlabhji (1996) found that the convenience and flexibility of taking an internet course had a negative side. "To succeed, students had to be self-motivated and internally driven to seek information, post messages on electronic bulletin boards, do the required readings, and interact with other students. In the wake of minimal external constraints or time lines, students found it easy to let things slide" (p. 94). This challenge could quite easily be generalized to other distance delivery techniques including print-based correspondence. In a face-to-face environment, expressions and gestures can serve to motivate learner participation and performance. Members of a "captive audience" may be more likely to complete learning activities because their failure to do so is more visible.

***Allocation of time.*** Teaching at a distance can be extremely time consuming from

the instructor's viewpoint. For an internet course, an instructor must respond to students' e-mail; check bulletin boards, listserves, and chatrooms for appropriate information; research web sites that would be appropriate for class discussion; develop web-based materials; and work around technology-related breakdowns (Lacina-Gifford & Kher-Durlabhji, 1996). Instructors may want to manage their time by assigning specific days of the week for responding, responding to questions on a bulletin board to avoid answering duplicate questions, assigning students or assistants to research web sites and ensuring that the organization will provide technical support as required.

In addition to instructors needing to allocate time for planning and facilitating a distance delivered program, learners must also manage their time. Thomson (1993) examined correspondence study for agriculture extension agents. Findings indicated that "participants found it difficult to allocate time to carry out independent learning. They also found it easy to procrastinate" (p. 5).

***Summary***

There is no "single best model of distance learning" (Office of Technology Assessment, 1989, p. 26). It is important for developers to understand the needs of the learners, the methods that will best meet the needs, and then choose technologies that will enhance the educational experience. Technologies may be incorporated into the planning to add a collaborative or communication component.

Merrill (1998) states:

> We need to wake up and recognize that information is not instruction .... Just having information isn't sufficient. If you don't provide an adequate knowledge

structure, if you don't provide adequate guidance, people don't learn and certainly don't learn the right things. (p. 37)

### *Distance Education in Agriculture Extension*

Distance education (DE) is a relatively new technique in agriculture extension. Traditionally, extension meant that district staff met with their farm clients one-to-one at the farm site, organized kitchen meetings with neighbors, delivered information in large group seminars, or imported outside specialists for large community meetings. Farm clients are faced with the same time pressures as many other adults wishing to increase their knowledge on specific subject areas. They have barriers to participating in face-to-face education including distance from the program, time to allocate to education, child care and other commitments such as off-farm employment. "The opportunities for distance education in agricultural education include delivering programs to broader audiences with learners of all ages and from diverse backgrounds as well as a promise of partnerships and collaborative efforts with agricultural extension services and agribusinesses as never before" (Murphy & Terry, 1995, p.1).

### *Distance Technologies in Agriculture Extension*

Trede and Whitaker (1998) indicate that changes in agricultural technology have already altered extension program delivery methods. "The internet and the World Wide Web (WWW) make the latest information available via computers and modems" (p. 4). There continues to be barriers for clients in using technology. Samson (1998) states that "in some rural areas, factors immediately external to internet technology have hampered successful use of the WWW. Reliability of telephone service in many rural areas is not at

the same level of support that is found with their urban counterparts" (p. 2).

In addition to internet, extension agents are using fax and e-mail to communicate with clients. These technologies give extension personnel opportunities to be more reactive, efficient, and timely in meeting client needs (Siegrist, Labarge & Prochaska, 1998).

Murphy and Terry (1995) conducted a study "to develop a consensus to provide focus and direction for future research activities concerning the adoption of electronic communication, information and imaging technologies for instructional use in agricultural education settings" (p. 2). Their conclusions were as follows:

1. Electronic communication, information, and imaging technologies will improve how we teach in agricultural education settings. They will allow us to reach more students, more effectively, with better information.
2. Obstacles: time required by faculty to become proficient in technologies, lack of commitment for use to improve instruction, lack of faculty support to adopt technologies, lack of funding and cost of technologies, and lack of incentive to use technologies.
3. Computer-based telecommunications technology was identified as the dominant group for the most promising technology. (Murphy & Terry, 1995, p. 5)

As with all new technologies from farm equipment to distance education tools, there is a rate of adoption for both extension workers and their clients. Some are anxious to try any new technology, whether it has been successfully tested or not. Others are unwilling to try anything that is different from what they have been using in the past.

Rogers and Shoemaker (1971) and Lamble (1984) discuss adopter categories, explaining that "one aspect of the client system that affects the rate of adoption is the distribution of innovativeness in the system. Innovativeness is the degree to which an individual is relatively earlier in adopting new ideas than other members of the system" (p. 38). He describes these stages as follows:

1. Innovators - venturesome and eager to try new ideas (2-3%).
2. Early adopters - respected members of the system with high social status and possess a great deal of opinion leadership (10-15%).
3. Early majority - the approximate one-third of members who adopt just before the average member.
4. Late majority - the approximate one-third of the population who adopt just after the average member in the social system. These members are skeptical and are only convinced after most of their peers have adopted.
5. Laggards - traditional and oriented to the past. These members are the last 15% to adopt. (Lamble, 1984, p. 39)

Distance education is a new way of learning for many people. There will be both extension agents and clients at each end of the adoption spectrum; therefore, there will be a challenge for innovative extension agents to be able to deliver information and education in the best method for the individual client and an even greater challenge for the laggard extension agents to be knowledgeable about how many of their more innovative clients may be operating.

***Extension Agent Knowledge and Skills***

Several Canadian and American post-secondary institutions and extension offices offer agriculture related courses by distance, using a variety of technologies from print-based to internet and a combination of everything in between. One of the greatest challenges in offering these programs by distance is the lack of knowledge and experience of the technical specialists (i.e., extension agents) in distance education.

Jackson, Raven, and Threadgill (1995, p. 241) indicated that the needs of the learner are "paramount" and that cooperative extension agents need to have a clear understanding of distance education, what it can do for them, and what it can do for their clients. New skills in course planning and delivery are needed to help make the transition to distance delivery. Methods of instruction and teaching techniques in distance education will be new to many extension agents. Group discussions, idea sharing and other interactive techniques that are staples for extension can still be used in a distance learning environment; however, the facilitation of these events will change, with more of the responsibility given to the instructor for helping participants make connections between ideas. Timing changes drastically, as distance delivery is most often used to allow students to work at their own pace in their own time. This will have implications for how the course time lines are established.

Other considerations include how to provide feedback to learners so that the knowledge and skills they are gaining can be practiced as soon as possible. Learners also generally want to have printed materials to refer to at a later time. Developing printed supplemental materials for a distance delivered course should provide additional

information and references for further research.

One of the challenges in distance education for many learners is the lack of learner-instructor and learner-learner interaction. Interaction is important for a variety of types of learning, learner satisfaction and persistence of DE students (King & Doerfert, 1995). Building opportunities for interaction in any type of educational program must be intentional, whether it is a distance or face-to-face environment. One of the obstacles for many students and teachers to using technology is the perceived lack of opportunity for interaction; however, technologies such as bulletin boards, discussion groups, and other computer-related communications have been used successfully.

"If the teacher on the system is good, the technology itself can become almost transparent. Conversely, no technology can overcome poor teaching; poor teaching is actually exacerbated in DE applications" (King & Doerfert, 1995, p. 202). In fact, a study done by Miller (1995) seems to indicate that agricultural distance learners may have less need for interaction with the instructor or other students. As well, as a group, these learners want to control their pace of learning, prefer independent study and have less need for structured learning experiences. Such preferences are consistent with those of field-independent learners and are well suited to the nature of distance learning programs. Females were found to be especially field independent. Field dependence/independence is defined as a "psychological dimension that relates to global versus analytical perceiving and the ability to perceive items without being influenced by the surrounding field" (Miller, 1995, p. 25).

In contrast, much of the literature emphasizes the interactive component of

distance learning as being a key to acceptance as well as to successful learning. "Distance education efforts should be learner focused, with teachers providing an environment for interactive learning" (Heil & Herrington, 1997, p. 24).

Miller and Carr (1997), citing Willis (1994), indicate that those who teach at a distance must:

> ...develop an understanding of the characteristics and needs of distant students with the first-hand experience and limited, if any, face-to-face contact; adapt teaching styles taking into consideration the needs and expectations of multiple, often diverse audiences; develop a working understanding of delivery technology, while remaining focused on their teaching role; and function effectively as a skilled facilitator as well as a content provider. (pp. 1-2)

Lippert, Plank, Camberto and Chastain (1998) researched regional extension in-service training via the internet and found that the internet approach to instruction has tremendous potential for training county extension agents. This format eliminated the need to travel to another location, thus saving time and money; however, it was also noted that this approach to in-service training requires considerable planning in anticipation of possible problems. The study concluded that "to make a successful training program, it was important to choose a topic of wide interest, to create an appealing and well designed web page, and ensure that the users would encounter as few problems as possible utilizing the internet" (p. 7).

***Summary***

Although agricultural education by distance seems to be a rather untapped pattern

of education, there are several institutions beginning to study the possibilities quite extensively. Iowa State University and Texas A & M seem to be the leaders in agriculture DE. They offer extension programs as well as credit courses toward degrees using technologies such as video conferencing and the internet. Iowa, Vermont, Virginia, and Montana cooperative extension divisions are delivering portions of their pesticide training program using distance education technologies, namely interactive video for individuals, multimedia programs for small groups and video teleconferencing for larger groups (Vitzthum & Schylze, 1994).

### *Distance Education in Alberta Agriculture*

In June 1996, Dr. Terry Anderson, of the University of Alberta, Academic Technologies for Learning and two colleagues, completed a Farm Business Management Initiative (FBMI) project, *Alternative Delivery Options Processes and Technologies (ADOPT)* (Anderson, Kysela & Williamson, 1996). The project investigated the learning, teaching, technological and cost effectiveness of five delivery technologies: print based correspondence, audiographic conferencing, video conferencing, Computer Assisted Learning (CAL) and Internet.

A follow-up study by LeadComm Consulting (1997) researched the profile of current Alberta Agriculture, Food and Rural Development clients who participate in educational opportunities (structured courses and seminars), the use of distance delivery methods being used in the department, the use of distance delivery methods being used in other provincial departments and agriculture organizations, and the potential for expanding distance delivery. Research methods in the LeadComm project consisted of a

literature review, interviews, and review of department surveys.

The LeadComm research revealed that although there is not a great amount of agriculture-related distance education being completed for non-credit or community education, there is a great potential and many agencies/organizations are beginning to look at the possibilities. *The Agricultural Education Magazine* (February, 1994) featured several articles centered around the theme of distance education in agriculture. Miller and King (1994) encourage agricultural educators to not only read material on distance teaching and learning, but to experience distance education as both a student and a teacher. In their opinion, agricultural educators have an opportunity to lead the way in "taking the distance out of distance education." (p. 6)

Within the Alberta market at this time, there may be only a small group of farm clients who would be interested in learning by distance. Farm Business Management Initiative (FBMI) research indicates that many farmers like to attend face-to-face meetings for the interaction with other farmers and the instructor (Canada-Alberta Farm Business Management Initiative, 1996). It appears that those who prefer to learn by distance take the opportunity to do so through Home Study and distance courses through FBMI, and those who prefer face-to-face learning take courses through district offices and FBMI seminars. The 1992 Home Study survey outlined several learning styles that explain some of these differences in learning preference.

Both FBMI (1996) and Home Study (1992) surveys indicate that as education levels increase, so does computer ownership. The use and ownership also tends to be inversely related to age. There may also be a correlation to the gross income of farmers.

Both surveys indicate that a large portion of agriculture learners are in the over $100,000 gross sales range.

The *1998 Western Canadian Benchmark Survey* (Garvin & Associates, 1999) indicated that "the top three preferred means farmers used to gather information are written material, video tapes and fax bulletins; however, the interest level in using the internet has increased significantly over the last two years" (p. B-2). Results indicated that the percentage of Alberta farms/ranches with an internet connection has increased from 10% in 1996 to 34% in 1998.

> There is an apparent shift in willingness and interest to use higher technology means of gathering information; however, actual actions taken to gather information are still predominantly the traditional techniques of conversations with neighbors, discussions with professionals, farm/ranch journals, newspapers and other written material, television and radio programs, and contacting agriculture extension agents. (Garvin & Associates, 1999, p. B-3)

It may take additional education to train clients on the use of technology for learning. One of the major barriers to introducing new methods of learning and teaching is a lack of knowledge and low comfort level with the process and the technology. As well, suppliers of agriculture education may need to be a little more creative in providing opportunities for interaction, so that those learners who prefer to interact with one another and with the instructor have opportunities to do so that enhances their learning experience.

Alberta Agriculture's website, Ropin' the Web, includes on-line information and

publications for both clients and staff. The site serves as a central information center. Extension researchers at Oregon State University established an on-line electronic publication centre, developed primarily for use by cooperative extension staff. Freeman, Whitman, Tormoehlen, and Embleton (1997) report the following potential advantages of WWW publication and distribution: (a) information can be made available to a great many potential users; (b) on-line data can be updated at any time, ensuring that information remains current; and (c) printing and distribution costs are eliminated (p. 17). The same study outlined the following disadvantages of on-line publishing: (a) users must first know the site's URL before they can access and retrieve the information; (b) electronic publications lack some desirable properties of the more "tangible" paper-based materials (e,g, portability); and (c) it is likely that some portion of the intended audience will never use the internet or will always prefer paper-based formats (p. 17).

Although there are several technologies used for distance delivery, some seem to be more viable than others for use by Alberta Agriculture. Cost and accessibility are the two most prominent barriers in making the decision on what will work best; however, the needs of the learners (clients) must also be considered. The use of the Internet is becoming more popular by many education providers; however, access to the technology, knowledge of its use and usefulness of the educational experience by the client must be considered. It is not inconceivable that a traditional paper-based course supplemented by a video tape may be the best choice for some clients and for some content.

### *Summary*

There is increasing interest among staff who want to consider alternatives for extension education in Alberta Agriculture. Distance education technologies would be one alternative; however, the comfort level of staff in using the technologies as well as in planning and facilitating distance learning is uncertain.

The literature revealed that although there is not a great amount of agriculture-related distance education for non-credit or community education, there is a great potential and many agencies and organizations are beginning to look at the possibilities. The current literature tends to focus on agriculture distance education in a formal or structured environment, as opposed to the more community-based education of Alberta Agriculture. Some conclusions and recommendations with regard to design issues, technology advantages and disadvantages and the uses of technology for distance delivery can be transferred. Within the Alberta market at this time, there may be only a small group of farm clients who would be interested in learning by distance. Farm Business Management Initiative research indicates that many farmers like to attend face-to-face meetings for the interaction with other farmers and the instructor. It appears that those who prefer to learn by distance take the opportunity to do so through Home Study and distance courses through FBMI, and those who prefer face-to-face learning take courses through district offices and FBMI seminars.

It may take additional education to train both staff and clients on the use of technology for learning. One of the major barriers to introducing new methods of learning and teaching is a lack of knowledge and low comfort level with the process and the

technology. As well, suppliers of agriculture education may need to be more creative in providing opportunities for interaction, so that those learners who prefer to interact with one another and with the instructor have opportunities to do so which enhance their learning experiences. To do this, however, Alberta Agriculture staff who may be involved in developing and managing distance education opportunities must also have the knowledge and skills required to make such new ventures successful.

It is this knowledge and these skills that the present needs assessment study will explore so that professional development can be designed and offered to staff who wish to pursue developing distance education opportunities for their clients.

# Chapter 3
# Method of the Study

## *Introduction*

Strauss and Corbin (1990) define qualitative research as:

> any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification. It can refer to research about persons' lives, stories, behavior, but also about organizational functioning, social movements or interactional relationships. (p. 17)

This chapter describes the method of this qualitative study, which also made limited use of descriptive and inferential statistics, including research design, description of the sample and population, data collection techniques, data analysis techniques, trustworthiness, and limitations and delimitations.

## *Design*

A needs assessment may be broadly defined as "a systematic set of procedures undertaken for the purpose of setting priorities and making decisions about program or organizational improvement and allocation of resources. The priorities are based on identified needs... a need is a discrepancy between current and desired results or consequences" (Witkin & Aultschuld, 1995, p. 4).

Queeney (1995) defines needs assessment as:

> A decision-making tool for continuing educator's use in identifying the educational activities in or programs they should offer to best meet their clients' - and society's - educational needs. Although educational needs assessment, no

> matter how well conceived and executed, will not guarantee program success, incorporating carefully planned and implemented needs assessment into the program-planning process can substantially reduce uncertainty regarding program appropriateness and viability. As an integral part of the program development and delivery process, a high-quality needs assessment will yield practical data and inform program planning. (pp. 1-2)

One of the greatest challenges with a needs assessment can be getting "buy-in" from stakeholders, particularly in a political atmosphere such as a government department. Staff tend to be somewhat skeptical of needs assessment or evaluation projects, and particularly skeptical of the usefulness of the results. In addition, there are always hidden agendas within departments, with different sectors continually competing for available funds.

The purpose of this study was to identify professional development needs of Alberta Agriculture Regional Advisory Services (RAS) specialists in developing and facilitating distance education opportunities for customers. The design of the study began with the formation of a core committee to advise on the application of three methods of data collection for this research — survey, focus group interviews and one-to-one interviews. In addition, support from management was needed to conduct the research within the department and to provide resources to complete the project.

***Gaining Department Support***

Management personnel were contacted by telephone, in writing, and in person to discuss the study and to secure support for participation. The survey participants were

initially approached using an introductory letter that explained the purpose of the study and their involvement (see Appendix A). This letter, and all subsequent communication, was delivered through the department Lotus Notes system which is accessible to all staff. Participants for the focus groups were invited by Email to participate. Written confirmation followed with details of the study and expectations of participation, as well as information on opting out. Interview participants were contacted by telephone with personal and written follow-up confirmation including details of the study and opting out information.

### *Core Committee*

For this study, three staff who were interested in distance education and had some research experience were invited to form a core committee to have input into the needs assessment process. Committee members all have field experience, but now hold different positions within the department including management, specialist, and project advisor. Their role was to provide feedback on the survey questions as they were being developed, pilot the survey, suggest focus group participants and key questions, and assist with choosing interview participants and develop interview schedules. They also provided a great deal of encouragement to staff to participate and were instrumental in liaising with upper management to build support for the project.

## *Sample and Population*

The target population for the study was Alberta Agriculture staff involved in the development or delivery of educational programs and materials. The sample differed somewhat for each of the research methods used. These differences are elaborated below.

***Core Committee***

The core committee comprised one key manager and two staff members of AAFRD who are currently involved in distance education or staff development issues. They were purposively selected on the basis of their knowledge and skills in the topic area, their involvement in these areas within the department, and their interest in the topic.

***Survey Sample***

The survey sample was selected to include all current RAS specialists in the department of Agriculture, Food and Rural Development. There are 134 individuals in the following disciplines across the province: forage crops, specialty crops, cereal and oilseed crops, range management, soils, pork, beef, farm management, marketing, rural development - business, rural development - organizations, 4-H, and agri-food. Of the 134 individuals surveyed, 91 responded giving a return rate of 68%.

Regional Advisory Services provides integrated information and services to the agriculture and food community/industry to support rural people, prosperity and preservation. It plays a key role in extension, research, information development and information packaging to help industry meet its information needs and business opportunities. Clients value the role RAS has in providing high quality information and linkages to other information sources as well as a client service approach, accessibility and responsiveness. RAS focuses on the provision of:

1. applied research and new information development,
2. extension education, training and skill development,

3. indepth consulting for problem solving and business development,
4. quality and timely information and knowledge,
5. packaging of information,
6. facilitation of rural/regional economic and industry development in the agrifood industry,
7. environmental sustainability information and knowledge.

RAS specialists in the 56 district offices across the province are considered "front line" and generally have initial contact with clients. Specialists are considered to be responsible for the needs assessment of clients and determining the most effective methods of meeting those needs. This includes developing and delivering education programs, providing one-on-one consultations, providing information and doing research projects. They partner with agribusiness, colleges and universities, farm and community organizations, and other government departments.

***Focus Group Participants***

Eight RAS staff were invited to participate in one focus group session for the purpose of clarifying survey results. Participants were purposively selected for their experience with the department, understanding of extension practices and knowledge of professional development opportunities. They were individuals who have good rapport with colleagues and who were believed to be trusted to speak on behalf of their colleagues with knowledge. Selection was done by me with input from the core committee. Five staff, each from a different discipline, accepted the invitation. Experience with the department ranged from two to fifteen years, and all have:

represented their colleagues on various committees in the past, taken a variety of professional development courses, and a strong belief in customer service.

***Interview Respondent Group***

Three AAFRD staff were selected purposively for one-on-one interviews. All three individuals in the respondent group were AAFRD staff who have some influence on RAS staff training and development as well as some knowledge of distance education technologies and techniques.

## *Data Collection*

Three approaches were used to collect data -- survey, focus group interview, and one-on-one interview. The survey was designed to gain an understanding of the experience and opinions of RAS specialists about professional development and distance education both qualitatively and quantitatively. The issues identified in the survey results were then used to build focus group and one-on-one interview questions to further clarify and expand on those issues.

***Survey***

Surveys "furnish data for system-specific, time-based decisions about priorities for planning, resource allocation, or program evaluation. The survey format and methods of data analysis should allow inferences to be drawn about priorities and criticality of needs" (Witkin & Altschuld, 1995, p. 130). Level one needs were the target with this method and the survey was sent to all Regional Advisory Services specialists in Alberta Agriculture. Content was derived from the literature review and core committee input. A cover letter explaining the purpose of the survey was included along with an explanation

of how the results would be used.

The survey was done within a Lotus Notes Email message, and sent to all RAS specialists. Respondents had the option of answering the questions electronically and returning it on Lotus Notes or printing the survey and returning it completed in hard copy form. Of 134 surveys sent, 68% were returned -- 14 in hard copy format and 77 electronically. The survey took about 15 to 20 minutes to complete. Participants were instructed that all responses would remain confidential with no name, position, or location attached to any comments. A copy of the cover letter and survey is included in Appendix B.

***Focus Group Interview***

The focus group interview was a small group interview with a limited set of questions. The structure allowed a fairly cohesive group of five people to discuss the central theme of professional development needs for delivering distance education in agriculture and to provide perceptions and views about the topic. The purpose was not to obtain consensus, but simply to find out what staff think about DE issues and the future possibilities.

The focus group discussion questions were formulated from the survey results (see Appendix C). Using a semi-structured interview process, the focus group met face-to-face for about 90 minutes to discuss the results of the survey, clarify any questions or concerns, discuss the pre-developed questions and identify other issues and considerations about distance education in AAFRD that may not have come out of the survey. Each member read and signed a consent form (see Appendix D).

Results of the focus group interview were compiled and sent to each of the participants for their review. They were given the opportunity to make comments and to state any concerns about confidentiality If a comment could be traced to an individual or position, then the wording was changed or the comment omitted.

***Interviews***

One-on-one interviews were conducted with three key individuals in the department who have some influence over the use of the results from this research. The interviews were 30 to 60 minutes in duration. A semi-structured interview format was used to address specific issues and to clarify information emerging from the surveys and focus group. There was also opportunity left for open-ended questions to best take advantage of the knowledge, skills and experience of each interviewee. Specific questions are not included in this paper to protect the identity of individuals. Topic areas focused on current professional development opportunities, the potential for using distance education for professional development, and pilot project ideas for distance education programs.

## *Data Analysis*

Data collected in the open-ended survey questions, focus group interview and one-on-one interviews were all initially qualitatively analysed using open coding. Open coding is "the process of breaking down, examining, conceptualizing, and categorizing data" (Strauss & Corbin, 1990, pg. 61). Categorizing is "the process of grouping concepts that seem to pertain to the same phenomenon" (pg. 65) and can be done using line-by-line analysis, sentence or paragraph major ideas, or an entire document. In this study, open coding was done using major ideas from sentences or paragraphs from the three data

sources. Data collected in the survey through the use of closed form and Likert-type scale questions were analyzed using descriptive and inferential statistics.

***Survey***

The open-ended survey questions were examined both inductively and deductively to extract themes for training needs, perceptions of current knowledge, and confidence with distance education technologies and their use for serving clients. Once the data were collected and compiled within each question, I reviewed the results several times to get a sense of the types of themes that might be induced. The data were coded using colored markers, grouping "like" comments. In addition, the data were reviewed to identify any themes that might relate to ideas and issues found in the literature as well as those that may have been discussed with colleagues.

Themes were clarified and expanded upon in the focus group and interviews. An auditor examined the survey transcripts to corroborate themes. A second auditor reviewed themes and interpretations of the data.

Data collected from the closed form and Likert-type scale survey questions were analysed using data analysis computer software. Responses of the production specialists to business and organization management specialists were analyzed using Chi-square Goodness of Fit tests (closed form questions) and t-tests (Likert-type scale questions). In addition, responses between the five groups generated from the number of years of experience in agriculture extension were descriptively compared.

These responses were tabulated and are presented in the forms of frequencies and mean scores as they relate to the specific questionnaire items.

### *Focus Group Interview*

The purpose of the focus group interview was to clarify survey results and to identify any additional issues that should be addressed in the one-on-one interviews. Comments were used to expand on themes identified from the survey results, and to make final recommendations.

Data obtained from the focus group interview were examined both inductively and deductively using the same process as with the open-ended survey questions. The same themes identified in the survey data were used as the basis to begin coding. The data were then examined inductively to note any themes that may not have been previously identified.

### *Interviews*

Interviews were the culmination of all data derived from the survey and focus group session. Interview data were both inductively and deductively analysed in the same manner as the open-ended survey data and focus group interview data. More focused questions led to slightly different themes to aid in addressing different aspects of the research question. These analyses were used to identify conclusions, recommendations, issues, and concerns for AAFRD.

## *Trustworthiness*

The purpose for addressing trustworthiness is to mitigate the effects of my personal beliefs and predispositions. As a past student of distance education and a confident user of educational technologies, I believe that there are many opportunities for using new methods for educating Alberta Agriculture clients. I believe that there are

clients who would be accepting of these new methods, and be willing to experiment with them. I also believe, however, that the majority of RAS specialists may not be ready or willing to attempt these new methods. Extension has a tradition of being "hands on" and I would suspect that most specialists also prefer to learn the same way. Their strength is in their "people skills," and until there is a proven method of education that will give the same results as face-to-face, this group may not be willing to go forth.

I also believe that there are other staff in the department, including RAS, who are very eager to try new methods of education and extension. I hoped that the outcomes of this research would help to define some potential projects that would encourage these "keeners" and begin to provide some distance education experience to staff so they will be more open to trying it with clients.

Trustworthiness in this study was addressed using four major concerns outlined by Guba (1981): credibility, transferability, dependability and confirmability (pg. 80). Each of these terms is defined and then expanded on to more fully describe how each is met through various methods.

***Credibility***

> ...naturalistic inquirers are most concerned with testing the credibility of their findings and interpretations with the various sources (audiences or groups) from which data were drawn. The testing of credibility is often referred to as doing "member checks," that is, testing the data with members of the relevant human data source groups. (Guba, 1981, p. 80)

Methods used in this study to address credibility were peer debriefing,

triangulation, and member checks.

***Peer Debriefing.*** Peer debriefing "provides inquirers the opportunity to test their growing insights and to expose themselves to searching questions" (Guba, 1981, p. 85). This study used a core committee to build the survey questions to help insure that the data derived from them would best answer the research question and provide the information needed. The members also played a significant role in asking questions about the research, providing other points of view, and critiquing research methods along the course of the study.

***Triangulation.*** Three different methods of data collection were used to provide different perspectives and to cross-check data and interpretations. In addition to the initial core committee reactions to the research questions, the survey, focus group interview and one-on-one interviews were all used to cross-check data. The results of the survey were used to build the focus group discussion questions for the purpose of clarifying the results. Finally, the one-on-one interviews with key staff in AAFRD provided another perspective on the same questions. Both survey and focus group data provided the key issues to be discussed in the interviews.

***Member Checks.*** Member checks were used for both the focus group and the interviews. A copy of the focus group notes was sent by Lotus Notes to all participants with an invitation to provide feedback with regard to the inaccuracy of statements recorded or any concern about participants being identifiable from recorded statements. Member checking was done in the same manner with the one-on-one interview participants. Neither group suggested any changes.

***Transferability***

> ... the concept analagous to generalizability (or external validity) is transferability, which is itself dependent upon the degree of similarity (fittingness) between two contexts. The naturalist does not attempt to form generalizations that will hold in all times and in all places, but to form working hypotheses that may be transferred from one context to another depending upon the degree of "fit" between the contexts. (Guba, 1981, pg. 81)

Methods used to address transferability were theoretical/purposive sampling and thick description.

***Theoretical/Purposive Sampling.*** The sampling for all three data collection methods used was purposive to help maximize the depth of information. The purpose of the study was to examine the professional development needs of RAS specialists, so all RAS specialists were sampled. To build on the survey data, the focus group and one-on-one interview samples were chosen for their depth of knowledge and experience with the topic.

***Thick Description.*** Thick description of the role of RAS and specialists was made in the population and sample section. This description included the specific specialty positions, an outline of the focus areas of RAS and an overview of the expectations of specialists in their roles and responsibilities.

***Dependability***

"The naturalist thus interprets consistency as dependability, a concept that embraces elements both of the stability implied by the rationalistic term reliable and of

the trackability required by explainable changes in instrumentation" (Guba, 1981, p. 81). Dependability was addressed through the use of an audited trail.

***Audit Trail.*** The analyses of the survey data were reviewed by an auditor who was not a participant in this research. This individual had knowledge and experience in both research and distance education and examined the survey data for themes identified by me. A small number of comments were made in the form of highlighted comments that might be important in other themes as well. The focus group was also asked to clarify survey data through the discussion questions presented.

A second auditor examined the results from the surveys and focus groups and made comments on themes and provided additional thoughts and considerations. This person was also very knowledgeable about the distance education and extension fields and was able to add useful insight into the research.

***Confirmability***

"...naturalists shift the burden of neutrality from the investigator to the data, requiring evidence not of the certifiability of the investigator or his or her methods but of the confirmability of the data produced" (Guba, 1981, pp 81-82). Triangulation addressed confirmability in this study.

***Triangulation.*** Triangulation has already been noted in relation to credibility. Three research methods were used — survey, focus group interview, and one-on-one interview — in addition to using the core committee as a research consultation team.

### *Delimitations and Limitations*

***Delimitations.*** This study has the following delimitations:

1. Participants were restricted to the department of agriculture in Alberta.
2. Participants in the survey were restricted to RAS specialists. The purpose of the research was to determine professional development needs only of these AAFRD staff members rather than of the entire department.

***Limitations.*** Limitations include the following:

1. Participation in all stages of the research was voluntary, which likely skewed the results somewhat due to a difference in the attitudes, knowledge and skills of those who agreed to participate as compared with those who did not.
2. Political constraints and the perception by staff that there was a hidden agenda held by management or specific program groups with a vested interest in getting project funding.
3. Although generalizability of this research is at risk, the goal is transferability of findings. The extensive description of Alberta Agriculture's role in agriculture extension and the role of specialists has been made in the section on population and sample. General information from the needs assessment may be transferrable to other provinces and states where similar systems of agriculture extension are in place.

## *Summary*

The three qualitative data collection methods of survey, focus group interview and one-on-one interviews were primarily used to address the research question. Secondary data from closed-ended questions and Likert-type questions on the survey were analyzed quantitatively using Chi-square Goodness of Fit and t-tests respectively. Of the 134 individuals surveyed, 92 responded. Five specialists took part in the focus group and three staff were interviewed one-on-one.

Trustworthiness in this study was addressed using four major concerns outlined by Guba (1981): credibility, transferability, dependability and confirmability (pg. 80). Each of these terms was defined and then expanded upon as dealt with in this study. Methods used were: peer debriefing, triangulation, member checks, theoretical/purposive sampling, thick description, and audit trails.

The next chapter gives a detailed outline of the findings gleaned from the data collected.

# Chapter Four
# Findings

## *Introduction*

The purpose of this research was to identify training and development needs for Alberta Agriculture Regional Advisory Services (RAS) staff as they move toward providing services to clients by distance delivery. The research problem addressed was: What are the professional development needs of Alberta Agriculture Regional Advisory Services (RAS) specialists in developing and facilitating distance education opportunities for customers?

To help explore the research question, three sub-questions were addressed:

1. What is the preferred format for professional development programming?
2. Which distance education technologies will best meet RAS specialist needs for delivering instruction to their clients?
3. What resources are available to RAS staff to provide opportunities for self-directed learning?

This chapter outlines the findings from the research, using the three sub-questions as the basis for organization: (a) preferred learning strategies, (b) distance education technologies, and (c) opportunities for self-directed learning. The context of the respondents is outlined first, to establish a basis for discussion.

## *Context of the Respondents*

To describe the context of the respondents, three types of data were collected. Demographic data focused on how each respondent categorized his or her specialty —

production or business/organization management — and the number of years of experience in the area of agriculture extension.

The second type of data helped me to determine the experiences of the respondents with technology either in obtaining or disseminating information. Questions were asked about the use of a variety of technologies as well as the exposure of respondents to distance education environments either as a learner or as a developer or facilitator.

The third type of data enabled me to establish some sense of the respondents' perceived importance and proficiency of their extension skills, information technology skills, and their abilities to determine their own professional development needs.

***Demographics***

Of the 91 participants responding, 59 (64.8%) categorized their role as a production role and 32 (35.2%) as a business/organization management role. In examining the job descriptions of the specialist disciplines, I would categorize the following specialty disciplines as production roles: forage crops, special crops, cereal and oilseed crops, range management, soils, ag water, ILO siting, engineers, feedlot, swine and beef. The following disciplines would be business/organization management roles: farm management, marketing, rural development - business, rural development - organizations, 4-H and agri-food.

Agriculture extension employees tended to be very experienced in their field. Years of experience data in agriculture extension indicated that the over 20 years category had the greatest frequency at 36.2%. The lowest frequency was in the 6 to10 years

category at 11%. Table 1 shows all categories of years of experience in agriculture extension by frequency and percentage in the production and business/organization management categories.

The years of experience represented by each specialty category was fairly evenly distributed except in the 6 to10 years where the percentage of business/organization management specialists was nearly twice as many as for production specialists.

**Table 1**

**Years of Experience in Agriculture Extension by Specialty Area in AAFRD**

| | Production (n = 59) | | Business/Organization Management (n = 32) | |
|---|---|---|---|---|
| | f | % | f | % |
| 0-5 Years | 13 | 22.0 | 6 | 18.8 |
| 6-10 Years | 5 | 8.5 | 5 | 15.6 |
| 11-15 Years | 8 | 13.6 | 5 | 15.6 |
| 16-20 Years | 11 | 18.6 | 5 | 15.6 |
| Over 20 Years | 22 | 37.3 | 11 | 34.4 |

*Experience*

***Experience with Technologies.*** A variety of technologies are available to RAS specialists for gathering information in self-learning activities or for responding to client inquiries. Production and business/organization management groups were compared using Chi-square goodness of fit tests to determine significant differences in the use of seven technologies. Internet and print material were reported by 100% of both groups as

being technologies that they used for themselves and clients (see Table 2). There was a significant difference at the 0.05 level between production and business/organization management groups in the use of video, television and film ($x^2 = 5.0$, $n = 91$). Business/organization management specialists were more likely to use this type of technology (96.9%) as compared to the production specialists (79.7%), although both were quite high.

The lowest use of a technology, besides the "other" category was the use of CD-ROM; however, there was still over 50% of both groups that reported using it for gathering information.

**Table 2**

**Technology Used for Information Gathering by Specialty Area in AAFRD**

| | Production (n = 59) | | Business/Org. Management (n = 32) | | |
|---|---|---|---|---|---|
| | f | % | f | % | Chi-square |
| Computer: CD-ROM | 33 | 55.9 | 21 | 65.6 | 0.799 |
| Computer: Internet | 59 | 100.0 | 32 | 100.0 | N/A |
| Computer: Other software | 43 | 72.9 | 24 | 75.0 | 0.047 |
| Print material | 59 | 100.0 | 32 | 100.0 | N/A |
| Audio material | 40 | 67.8 | 23 | 71.9 | 0.160 |
| Video, television, film | 47 | 79.7 | 31 | 96.9 | 4.966* |
| Other | 21 | 35.6 | 11 | 34.4 | 0.013 |

* significant at the 0.05 level

Respondents were asked to identify any other technologies that they might use to gather information for themselves or for their clients. From the data gathered, the majority of comments fit into the following themes: (a) telephone/fax, (b) direct contact with researchers and other experts, (c) visual information gathered through research and demonstrations, and (d) training opportunities.

***Exposure to Distance Education Environments.*** Although specific information on depth and breadth of involvement in distance education courses was not asked of respondents, the purpose of gathering these data was to get a broad sense of experiences that RAS specialists may have had either as distance education learners or facilitators or developers of distance education programs. Table 3 summarizes these findings.

Of the production specialists responding, 33.3% reported having been part of a distance course as a learner. Almost three-quarters (71%) of business/organization specialists indicated participation as a learner. These differences were checked for significance using Chi-square goodness of fit tests. A significant difference, at the 0.05 level, was found between these two groups of specialists ($x^2 = 11.3$, $n = 91$).

No significant difference was found between specialty areas for participation in a distance course as a developer or facilitator. Production specialists reported a slightly higher, but non-significant, participation (29.3%) as compared to business/organization management (25.0%).

**Table 3**

**Participation in Distance Courses by Specialty Area in AAFRD**

| | Production (n = 59) | | Business/Org. Management (n = 32) | | |
|---|---|---|---|---|---|
| | f | % | f | % | Chi-square |
| Have you ever been part of a distance course as a developer or facilitator? | 17 | 29.3 | 8 | 25.0 | 0.189 |
| Have you ever been part of a distance course as a learner? | 19 | 33.3 | 22 | 71.0 | 11.299* |

* significant at the 0.05 level

***Skill Importance and Proficiency***

Specialists in RAS are expected to have, or acquire, a variety of skills in extension and information technology. Respondents were asked about their perceived proficiency in a variety of extension skills and information technology skills. Training and work plans for each individual specialist are determined by the specialist in cooperation with his or her immediate supervisor. With this in mind, it was also important to determine perceived proficiency in identifying training needs. In addition, respondents were asked to value the importance of each of the skills to their job.

***Extension Skills.*** Respondents were asked to rate the importance of needs assessment, setting objectives, determining resources, program design, evaluation, and distance delivery to their current job on a six-point Likert-type scale ranging from 0 (not at all important) to 5 (very important). They were also asked to rate their current proficiency in the same skills using a similar scale ranging from 0 (none at all) to 5

(expert). The mean and standard deviation for each question was determined. In addition, comparisons using t-tests were done to explore differences between production specialists and business/management specialists.

Table 4 shows the frequency distribution of the respondents' perceptions of importance of extension skills. All skills had a mean of 3 or greater, with determining resources having the highest (4.23) and distance delivery the lowest (3.21).

**Table 4**

**Frequency Distribution of the Importance of Extension Skills in Current Job**

| | Not at all important 0 | | 1 | | 2 | | 3 | | 4 | | Very important 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % | f | % | Mean | S.D. |
| **Needs Assessment:** Working with customers and other professionals to identify educational needs. (n = 91) | 3 | 3.3 | - | - | 3 | 3.3 | 10 | 11 | 34 | 37.4 | 41 | 45.1 | 4.14 | 1.01 |
| **Setting Objectives:** Identifying expected results. (n = 90) | 1 | 1.1 | 2 | 2.2 | 6 | 6.7 | 11 | 12.2 | 37 | 41.1 | 33 | 36.7 | 4.00 | 1.07 |
| **Determining Resources:** Identifying information sources that will help meet the objectives. (n = 90) | 1 | 1.1 | 2 | 2.2 | - | - | 8 | 8.9 | 40 | 44.4 | 39 | 43.3 | 4.23 | 0.93 |
| **Program Design:** Choosing methods and resources that will achieve the learning objectives of customers over the long term. (n = 90) | 1 | 1.1 | - | - | 2 | 2.2 | 15 | 16.5 | 41 | 54.1 | 32 | 35.2 | 4.10 | 0.88 |
| **Evaluation:** Determining the value of programs/activities by collecting evidence of results achieved. (n = 90) | - | - | 1 | 1.1 | 7 | 7.8 | 16 | 17.8 | 35 | 38.9 | 31 | 34.4 | 3.98 | 0.97 |
| **Distance Delivery:** Meeting customer needs through methods other than face to face. (n = 90) | 1 | 1.1 | 4 | 4.4 | 16 | 17.8 | 33 | 36.7 | 26 | 28.9 | 10 | 11.1 | 3.21 | 1.08 |

## Table 5

### Frequency Distribution of the Proficiency of Extension Skills in Current Job

| | None at all 0 | | 1 | | 2 | | 3 | | 4 | | Expert 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % | f | % | Mean | S.D. |
| **Needs Assessment:** Working with customers and other professionals to identify educational needs. (n = 91) | - | - | 1 | 1.1 | 7 | 7.8 | 32 | 35.6 | 38 | 42.2 | 12 | 13.3 | 3.59 | 0.86 |
| **Setting Objectives:** Identifying expected results. (n = 90) | 1 | 1.1 | 2 | 2.2 | 10 | 11.1 | 31 | 34.4 | 39 | 43.3 | 7 | 7.8 | 3.40 | 0.95 |
| **Determining Resources:** Identifying information sources that will help meet the objectives. (n = 90) | - | - | 2 | 2.2 | 5 | 5.6 | 21 | 23.3 | 51 | 56.7 | 11 | 12.2 | 3.71 | 0.84 |
| **Program Design:** Choosing methods and resources that will achieve the learning objectives of customers over the long term. (n = 90) | - | - | 1 | 1.1 | 9 | 9.9 | 38 | 41.8 | 34 | 37.4 | 9 | 9.9 | 3.45 | 0.85 |
| **Evaluation:** Determining the value of programs/activities by collecting evidence of results achieved. (n = 90) | - | - | 6 | 6.6 | 20 | 22.2 | 36 | 40.0 | 25 | 27.8 | 3 | 3.3 | 2.99 | 0.95 |
| **Distance Delivery:** Meeting customer needs through methods other than face to face. (n = 90) | 1 | 1.1 | 10 | 11.1 | 19 | 21.1 | 33 | 36.7 | 26 | 28.9 | 1 | 1.1 | 2.84 | 1.04 |

Respondents rated their perceived proficiency in the extension skills of needs assessment, setting objectives, determining resources, program design, evaluation and distance delivery. For all skills, means for proficiency were lower than for the importance of the skill to the job. Distance delivery had the lowest mean (2.84) while determining resources was accorded the highest (3.71). These values parallel the same low and high mean skills in the importance scale. Table 5 shows the frequency distribution of the proficiency of extension skills.

Comparisons of responses for both importance and proficiency of extension skills were conducted between the production and business/organization management specialist groups (Table 6). At the .05 level, significant differences between the two specialist groups were found for both perceived importance and proficiency of setting objectives ($t = 2.5$, $n = 91$ and $t = 2.06$, $n = 91$, respectively). This skill is defined as identifying expected results from programming. The business/organization management specialists valued this skill more than the production specialists in terms of both importance and their proficiency.

There was also a significant difference, at the .05 level, in the perception of proficiency in the program design skill ($t = -2.01$, $n = 91$). Program design was defined as choosing methods and resources that will achieve the learning objectives of customers over the long term. Again, the business/organization management specialists perceived their proficiency in this skill to be higher than the production specialists perceived theirs to be. In all skills, both groups rated the importance of the skills to be higher than their perceived proficiency level with the skills.

**Table 6**

**Importance and Proficiency of Extension Skills by Specialty Area in AAFRD**

| | IMPORTANCE Importance of the skill to the job | | | | | | PROFICIENCY Proficiency of the skill in the current job | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Production (n = 59) | | Bus./Org. Management (n = 32) | | | | Production (n = 59) | | Bus./Org. Management (n = 32) | | | |
| | Mean | S.D. | Mean | S.D. | t-value | Prob. | Mean | S.D. | Mean | S.D. | t-value | Prob. |
| **Needs Assessment** | 4.02 | 1.11 | 4.38 | 1.07 | -1.51 | 0.137 | 3.47 | 0.86 | 3.81 | 0.83 | -1.78 | 0.08 |
| **Setting Objectives** | 3.59 | 2.02 | 4.34 | 0.83 | -2.50 | 0.015* | 3.05 | 1.83 | 3.66 | 0.97 | -2.06 | 0.042* |
| **Determining Resources** | 3.93 | 0.90 | 4.38 | 0.87 | -1.49 | 0.140 | 3.46 | 1.89 | 3.78 | 0.66 | -1.19 | 0.238 |
| **Program Design** | 3.98 | 1.96 | 4.31 | 0.82 | -1.77 | 0.082 | 3.32 | 0.84 | 3.69 | 0.82 | -2.01 | 0.048* |
| **Evaluation** | 3.83 | 0.94 | 4.25 | 0.98 | -1.98 | 0.052 | 2.90 | 0.97 | 3.16 | 0.92 | -1.26 | 0.213 |
| **Distance Delivery** | 3.29 | 0.97 | 3.06 | 1.26 | 0.86 | 0.393 | 2.81 | 1.06 | 2.90 | 1.01 | -0.39 | 0.695 |

* significant at the 0.05 level

***Information Technology Skills***. Respondents were asked to use the same 0 to 5 Likert-type scales to rate the importance and their proficiency in the following information technology skills: performing internet searches, using word processing software, HTML coding, using e-mail, attaching documents to e-mail, using presentation software, facilitating computer conferencing, and using video-conferencing technology. The mean and standard deviation of each was determined, and then comparisons were done using t-tests to explore differences between production and business/organization management specialists.

Table 7 shows the frequency distribution of the importance of information technology skills. The range in means was quite broad, from 1.61 for HTML coding to 4.15 for using e-mail. Those technologies with means greater than 3.0 were: using e-mail (4.15), attaching documents to E-mail (4.02), using word processing software (3.98), performing Internet searches (3.86), and using presentation software (3.75).

As expected, the mean scores for proficiency of the same skills were lower; however they ranked in the same order. Proficiency in using e-mail had the highest mean (4.00) and HTML coding the lowest (0.89). Table 8 shows the frequency distribution of the proficiency in information technology skills.

**Table 7**

**Frequency Distribution of the Importance of Information Technology Skills in Current Job**

| | Not at all important 0 | | 1 | | 2 | | 3 | | 4 | | Very important 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % | f | % | Mean | S.D. |
| Doing an Internet search (n = 91) | 1 | 1.1 | 1 | 1.1 | 4 | 4.4 | 22 | 24.4 | 38 | 42.2 | 24 | 26.7 | 3.86 | 0.98 |
| Using a word processing program (n = 90) | - | - | 1 | 1.1 | 9 | 9.9 | 12 | 13.2 | 38 | 41.1 | 31 | 34.1 | 3.98 | 0.99 |
| HTML coding (n = 85) | 20 | 23.5 | 26 | 30.6 | 19 | 22.4 | 17 | 20.0 | 2 | 2.4 | 1 | 1.2 | 1.61 | 1.19 |
| Using e-mail (n = 88) | - | - | 1 | 1.1 | 6 | 6.6 | 13 | 14.3 | 29 | 31.9 | 42 | 46.2 | 4.15 | 0.98 |
| Attaching documents to e-mail (n = 88) | 1 | 1.1 | - | - | 10 | 11.1 | 7 | 7.7 | 40 | 44.0 | 33 | 36.6 | 4.02 | 1.03 |
| Using presentation software (n = 91) | 1 | 1.1 | 1 | 1.1 | 10 | 11.1 | 21 | 23.1 | 33 | 36.3 | 25 | 27.5 | 3.75 | 1.08 |
| Facilitating computer conferencing (n = 89) | 9 | 10.3 | 21 | 24.1 | 29 | 33.3 | 15 | 17.2 | 11 | 12.6 | 2 | 2.3 | 2.05 | 1.25 |
| Using video-conferencing technology (n = 91) | 9 | 9.9 | 21 | 23.1 | 27 | 29.7 | 21 | 23.1 | 9 | 9.9 | 2 | 2.2 | 2.07 | 1.22 |

**Table 8**

**Frequency Distribution of Proficiency in Information Technology Skills in Current Job**

| | Not at all important 0 | | 1 | | 2 | | 3 | | 4 | | Very important 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % | f | % | Mean | S.D. |
| Doing an Internet search (n = 91) | - | - | 3 | 3.3 | 12 | 13.2 | 27 | 29.7 | 33 | 36.3 | 16 | 17.6 | 3.52 | 1.04 |
| Using a word processing program (n = 90) | - | - | 4 | 4.4 | 10 | 11.1 | 20 | 22.2 | 31 | 24.4 | 25 | 27.8 | 3.70 | 1.13 |
| HTML coding (n = 85) | 46 | 54.1 | 17 | 20.0 | 12 | 14.1 | 6 | 6.6 | 3 | 3.3 | 1 | 1.2 | 0.89 | 1.22 |
| Using e-mail (n = 88) | 1 | 1.1 | 2 | 2.3 | 4 | 4.5 | 15 | 17.0 | 33 | 37.5 | 33 | 37.5 | 4.00 | 1.06 |
| Attaching documents to e-mail (n = 91) | 2 | 2.2 | 2 | 2.2 | 8 | 8.8 | 12 | 13.2 | 33 | 36.3 | 34 | 37.4 | 3.91 | 1.19 |
| Using presentation software (n = 91) | 1 | 1.1 | 13 | 14.3 | 13 | 14.3 | 24 | 26.4 | 28 | 30.8 | 12 | 13.2 | 3.11 | 1.29 |
| Facilitating computer conferencing (n = 89) | 40 | 44.9 | 25 | 28.1 | 14 | 15.7 | 8 | 9.0 | 2 | 2.2 | - | - | 0.96 | 1.09 |
| Using video-conferencing technology (n = 91) | 44 | 48.4 | 28 | 30.8 | 16 | 17.6 | 3 | 3.3 | - | - | - | - | 0.76 | 0.86 |

Comparisons of responses for both importance and proficiency in information technology skills were done between the production and business/organization management specialist groups (Table 9). At the .05 level, a significant difference in proficiency in attaching documents to e-mail was found, with the business/organization management specialists rating their proficiency higher than the production specialists. As well there was a significant difference found in proficiency of HTML coding. In this instance, production specialists rated themselves higher in proficiency than the business/organization management group.

Significant differences (at the 0.05 level) between the two specialist categories were found in the importance of HTML coding to the job ($t = 2.97$, $n = 85$) and in the proficiency of using a word processing program ($t = -3.35$, $n = 91$). Production specialists rated HTML coding as being more important to their job than the business/organization management group. The business/organization management group rated their proficiency in using a word processing program higher than the production group did.

It is interesting to note that the response rate for the HTML coding question was $n = 85$, as compared to $n = 91$ for the survey as a whole. There were several written comments noted with this question asking "what is HTML?" which suggests that a lack of knowledge is the reason for the lower response rate.

**Table 9**

**Importance and Proficiency of Information Technology by Specialty Area in AAFRD**

| | IMPORTANCE Importance of the skill to the job | | | | | | PROFICIENCY Proficiency of the skill in the current job | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Production (n = 59) | | Bus./Org. Management (n = 32) | | | | Production (n = 59) | | Bus./Org. Management (n = 32) | | | |
| | Mean | S.D. | Mean | S.D. | t-value | Prob. | Mean | S.D. | Mean | S.D. | t-value | Prob. |
| Doing an Internet search (n = 91) | 3.81 | 0.93 | 3.93 | 1.8 | -0.56 | 0.575 | 3.37 | 1.10 | 3.78 | 0.87 | -1.95 | 0.055 |
| Using a word processing program (n = 90) | 3.86 | 1.01 | 4.19 | 0.93 | -1.53 | 0.129 | 3.44 | 1.13 | 4.19 | 0.95 | -3.35 | 0.001* |
| HTML coding (n = 85) | 1.89 | 1.55 | 1.06 | 1.00 | 2.97 | 0.004* | 1.07 | 1.35 | 0.57 | 0.86 | 2.11 | 0.038* |
| Using e-mail (n = 88) | 4.14 | 1.03 | 4.19 | 0.90 | -0.25 | 0.803 | 3.91 | 1.18 | 4.16 | 0.78 | -1.18 | 0.240 |
| Attaching documents to e-mail (n = 91) | 4.08 | 1.09 | 3.91 | 0.93 | 0.82 | 0.413 | 3.73 | 1.32 | 4.25 | 0.80 | -2.33 | 0.022* |
| Using presentation software (n = 91) | 3.85 | 1.08 | 3.56 | 1.08 | 1.20 | 0.233 | 3.08 | 1.26 | 3.16 | 1.35 | -0.25 | 0.806 |
| Facilitating computer conferencing (n = 89) | 2.16 | 1.22 | 1.83 | 1.29 | 1.14 | 0.261 | 0.93 | 1.02 | 1.00 | 1.21 | -0.27 | 0.788 |
| Using videoconference technology (n = 91) | 2.21 | 1.28 | 1.81 | 1.09 | 1.55 | 0.125 | 0.7[illegible] | 0.85 | 0.81 | 0.90 | -0.43 | 0.666 |

* significant at the 0.05 level

***Determining Professional Development Needs.*** All RAS staff are responsible for developing their own training and work plans on a yearly basis. The plans are reviewed and approved by the manager. RAS staff training requests for the coming year are expected to coincide with the planned activities and identified professional needs. Respondents were asked to rate the importance of the following skills related to determining their professional development needs: identifying your own professional development needs, setting personal learning objectives, identifying appropriate methods to achieve your objectives, completing independent learning activities, and evaluating your performance. The importance scale was a Likert-type scale ranging from 0 (not at all important) to 5 (very important). Respondents were also asked to use a similar scale ranging from 0 (none at all) to 5 (expert) to rate their proficiency in those same skills.

Table 10 shows the frequency distribution of the importance of skills in determining professional development needs. For all five skills listed, the mean was higher than 4.0. The means for proficiency in these skills were slightly lower with a range from 3.24 to 3.67 (see Table 11).

**Table 10**

**Frequency Distribution of the Importance of Skills to Determine Professional Development Needs in Current Job**

| | Not at all important 0 | | 1 | | 2 | | 3 | | 4 | | Very important 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % | f | % | Mean | S.D. |
| Identifying your own professional development needs (n = 90) | - | - | - | - | 2 | 2.2 | 7 | 7.7 | 40 | 44.0 | 42 | 46.2 | 4.34 | 0.72 |
| Setting personal learning objectives (n = 90) | - | - | - | - | 4 | 4.4 | 11 | 12.2 | 46 | 51.1 | 29 | 32.2 | 4.11 | 0.79 |
| Identifying appropriate methods to achieve your objectives (n = 91) | - | - | - | - | 3 | 3.3 | 10 | 11.0 | 52 | 57.1 | 26 | 28.6 | 4.11 | 0.72 |
| Completing independent learning activities (n = 90) | - | - | - | - | 4 | 4.4 | 14 | 15.6 | 49 | 54.4 | 23 | 25.6 | 4.01 | 0.77 |
| Evaluating your performance (n = 91) | - | - | - | - | 8 | 8.8 | 9 | 9.9 | 45 | 49.5 | 29 | 31.9 | 4.04 | 0.88 |

**Table 11**

**Frequency Distribution of the Proficiency of Skills to Determine Professional Development Needs in Current Job**

| | Not at all important 0 | | 1 | | 2 | | 3 | | 4 | | Very important 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | f | % | f | % | f | % | f | % | f | % | f | % | Mean | S.D. |
| Identifying your own professional development needs (n = 90) | - | - | 2 | 2.2 | 8 | 9.02 | 22 | 24.7 | 42 | 47.2 | 15 | 16.9 | 3.67 | 0.94 |
| Setting personal learning objectives (n = 90) | - | - | 3 | 3.4 | 9 | 10.1 | 31 | 34.8 | 33 | 37.1 | 13 | 14.6 | 3.49 | 0.98 |
| Identifying appropriate methods to achieve your objectives (n = 91) | - | - | 2 | 2.2 | 13 | 14.6 | 31 | 34.8 | 35 | 39.3 | 8 | 9.0 | 3.38 | 0.92 |
| Completing independent learning activities (n = 90) | - | - | 5 | 5.6 | 15 | 16.7 | 30 | 33.3 | 29 | 32.2 | 11 | 12.2 | 3.29 | 1.06 |
| Evaluating your performance (n = 91) | - | - | 2 | 2.2 | 19 | 20.9 | 31 | 34.1 | 33 | 36.3 | 6 | 6.6 | 3.24 | 0.94 |

**Table 12**

**Importance and Proficiency of Skills in Determining Professional Development Needs by Specialty Area in AAFRD**

| | IMPORTANCE Importance of the skill to the job | | | | | | PROFICIENCY Proficiency of the skill in the current job | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Production (n = 59) | | Bus./Org. Management (n = 32) | | | | Production (n = 59) | | Bus./Org. Management (n = 32) | | | |
| | Mean | S.D. | Mean | S.D. | t-value | Prob. | Mean | S.D. | Mean | S.D. | t-value | Prob. |
| Identifying your own professional needs | 4.24 | 0.75 | 4.53 | 0.62 | -2.00 | 0.049* | 3.60 | 0.94 | 3.81 | 0.93 | -1.05 | 0.300 |
| Setting personal learning objectives | 4.07 | 0.75 | 4.19 | 0.86 | -0.66 | 0.515 | 3.39 | 0.96 | 3.69 | 1.00 | -1.39 | 0.170 |
| Identifying appropriate methods to achieve your objectives | 4.02 | 0.73 | 4.28 | 0.68 | -1.72 | 0.090 | 3.25 | 0.93 | 3.63 | 0.87 | -1.92 | 0.059 |
| Completing independent learning activities | 3.97 | 0.77 | 4.09 | 0.78 | -0.75 | 0.455 | 3.12 | 1.03 | 3.59 | 1.07 | -2.03 | 0.046* |
| Evaluating your performance | 3.98 | 0.84 | 4.16 | 0.95 | 0.86 | 0.393 | 3.19 | 0.90 | 3.34 | 1.00 | –0.74 | 0.462 |

* significant at the 0.05 level

Comparisons between responses for both importance and proficiency in skills to determine professional development needs were conducted between the production specialists and business/organization management specialists (Table 12). At the .05 level, there was a significant difference in the importance of identifying one's own professional needs ($t = -2.00$, $n = 91$). Business/management specialists rated these skills as more important. As well, the same group rated themselves more proficient in completing independent learning activities. There was a significant difference in the reported proficiency of this skill at the .05 level ($t = -2.03$, $n = 91$).

### *Preferred Learning Strategies*

The first sub-question addressed in the research was: What is the preferred format for professional development programming? Respondents identified what they believed to be important in terms of a preferred learning environment and well as strategies for meeting their professional development needs. Strategies for professional development included a variety of responses within the themes of formal training, hands-on experience, self-directed learning opportunities, and professional events.

#### *Learning Environment*

As expected, specialists indicated that they wanted training that was relevant to their jobs with facilitators who were knowledgeable, well prepared, and dedicated to meeting the needs of the participants. Facilitators should be available to the learners, they should have quality materials and they should also have identifiable goals and objectives for the training experience.

***Formal Training***

Respondents listed outside agencies and institutions 44 times and in-house courses 52 times as preferred training methods. Other comments in response to preferred training methods included degree and certificate programs and specific training courses on a single topic area. Respondents stated the importance of their own learning needs with comments such as the preference for "seminars or other sessions that meet my needs," "highly focused sessions tailored toward the needs of a small group," "courses that meet my needs whether in-house or outside," and "learner designed programs."

***Hands-On Experience***

Hands-on experience for professional development training included such activities as working with experts, secondments, co-operative projects, mentors, project work, and tours and workshops.

Mentors were mentioned 31 times as being a preferred method of professional development. One respondent defined it as,

> the ability to discuss with, compare experiences with, ask questions of and essentially "learn the trade" from an experienced individual working in the same field (and preferably in-house).

Secondments were mentioned 12 times. One respondent described a successful secondment as:

> ...focused on the development of new skills, this includes both learning and utilizing these skills. These opportunities should not be limited to departments within AAFRD or other areas of the public service, but should be solicited from

> outside organizations and firms which are on the leading edge of their respective industries or technologies.

Another said,

> The most successful secondments that I have witnessed involved production specialists seconded (as staff writers) to a weekly farm newspaper in order to sharpen their ability to communicate with their farm clients.

***Self-Directed Learning***

Specialists mentioned 42 times that self-directed learning is a preferred format for professional development. As examples, they indicated reading, research, and self-development with books, computer programs and library searches. Internet courses, distance education and news groups were also listed as means of facilitating professional development. Depending on the format, these types of distance delivered training opportunities could be considered self-directed or formal learning.

***Professional Events***

Conferences, industry gatherings, and professional development courses were mentioned as forms of training for professionals. It should be noted that the majority RAS specialists in agricultural roles must be eligible for membership in the Alberta Institute of Agrologists (A.I.A.), a professional organization, in order to meet the criteria for hiring.

### *Distance Education Technologies*

The second research sub-question addressed was: Which distance education technologies will best meet the needs of RAS specialists for delivering instruction to their

clients? The purpose was to get some sense of the technologies that staff would use and technologies that staff believe are available to their clients. The findings related to this question focus around four topic areas: (a) involvement of specialists in developing or delivering distance education programming, (b) useful technologies, (c) training in technologies needed to take advantage of opportunities with clients, and (d) barriers to using distance education.

***Involvement of Specialists***

Although less than 30% of specialists reported ever being part of a distance education course as a developer or facilitator, there were several suggestions made as to how they may want to become involved at a future time. These suggestions fit into the following themes: (a) student support and networking, (b) marketing, (c) development, and (d) delivery. There were also 10 comments from specialists indicating that there should be no role for specialists in distance delivery.

***Student support and networking.*** The specialist role in AAFRD includes consultations with clients and identification of specific client needs. Several specialists commented that they might have a role in distance delivery of programs as support people who do follow-up with clients taking distance education courses. This type of follow-up might include acting as a tutor or mentor in specific areas of expertise, conducting individual consultations on the subject area, providing additional technical information to build on course content, arranging for feedback or discussion during the course, responding to inquiries from clients during the course, and acting as a referral source to other experts.

The networking role was very much focused on the specialist's view that it is important to determine needs and then match those needs with appropriate services. Comments included: "knowledge of local district and clients," "adapting to district conditions," and "matching client needs with existing outlets for training." One specialist also went one step further to say,

> to identify an agency capable of delivering the desired training and having them develop and deliver.

***Marketing.*** As a first contact for clients, specialists also saw themselves as being active in marketing education opportunities to clients. By being aware of client needs, specialists could then make clients aware of distance delivery learning opportunities, advertise and explain programs, and market and promote existing programs to clients.

***Development.*** Development of distance delivered programming for clients ranged from developing the opportunity or idea to developing materials. Specialists identified the following tasks as potential roles in development: needs assessment, identifying learning objectives, program design, designing material, researching content, writing fact sheets, developing software, and reviewing material.

***Delivery.*** Some specialists did list "facilitator" or "instructor" as a perceived role for themselves in distance delivered courses; however, there was not an overwhelming response for this role. The majority of comments having any reference to delivery were more in line with networking and student support with the RAS specialist as a contact person for further information.

***No role in distance delivery.*** There were approximately 10 comments from

specialists stating that they did not want to have a role in distance delivery, or that they believed there was no role for them. The theme seemed to be that clients prefer a "live" person in a one-to-one learning environment. In addition, some specialists stated that they have enough to do in their jobs without adding yet another dimension. Four specialists made the following comments:

1. At this point, I have enough work with direct person-to-person contact: farmer calls, farm meetings, packaging extension material and partnership with industry and media to meet the needs of producers without working on distance delivery programs.
2. Most of my client training is done in a workshop or one-on-one setting. Most can be delivered in one short (1-5 hour) session.
3. No role for most farm clients because they do not have and cannot afford the technology.
4. Not considered at this point. My assumption is that it has less value as group dynamics and personal development are key to my work.

***Useful Technologies***

Respondents were asked to identify specific technologies that would be useful for delivering programming to clients. Responses were categorized into the following groupings: print-based; telephone and fax; video, radio and television; internet and e-mail; computer software; satellite conferencing; and multi-media.

Several comments suggested that some specialists are not particularly aware of all of the opportunities or technologies available for distance delivery. I also looked for

evidence that specialists would know which technologies their clients had access to. One commented

> Less than one-third of my clients are internet or e-mail connected. When that changes, I think the need for this technology will increase. Also, the cost for teleconferencing is too high for the benefits.

The term "interactive" was mentioned several times. As well, the comment "most people still prefer to see and know the person they receive information from" was stated more than once.

***Training in Technologies Needed***

To be able to utilize the technologies available for distance delivery to clients, specialists were asked to identify their training needs in distance delivery techniques and technologies. Major themes were: technology availablity, how to use technology, facilitation skills, instructional design, and other technical training including computer-related and video-conferencing training.

***Technology availability.*** Many of the specialists responded that a clearer understanding of the technologies and distance delivery options available to them would be useful. Several comments of "general awareness" were noted. One commented,

> Before I can identify my professional development needs, I need a better understanding of the distance education technologies and techniques. I don't even know all that is possible.

There were also comments related to RAS specialist training needing to be focused on client needs. For example, one respondent wanted in-servicing on how the

technology has changed and how it could be used beneficially with clients. Another respondent added that

> Following my increased understanding of the potential, then specific training in applying the technology [would be useful].

A third respondent suggested that he would like to know more about the "appropriate uses and times to use distance education."

***How to use technology.*** Although there were few suggestions in the specific area of how to use technologies, two comments were noteworthy. The first respondent indicated that he ... would rather have training in presentation technologies (projectors and imaging) and in my own area of specialty.

A second said that

> out-of-ministry secondments to organizations, including communications/media firms, as well as institutions like Athabasca University, that are using these new technologies [would be preferred training methods] .

***Facilitation skills.*** Some specialists wanted information on how to facilitate internet discussions and chat groups as well as learning how to communicate better with clients on-line. In addition, innovative uses of technology such as conducting focus groups via distance technology was mentioned.

***Instructional design.*** Factors throughout the process of instructional design were listed as professional development needs for staff. These factors ranged from assessing client needs to design of materials, implementation, follow-up and evaluation. Some specialists were very clear that they felt the use of technology was a method of meeting

learning objectives; using technology was not the objective itself. For example, one respondent commented that

> Identifying and building appropriate learning strategy based on needs assessment not the technology available.

Another respondent added;

> ...we are still responsible to deliver information effectively and economically. A point I will make is that technology should remain the slave, and not become the master. We make a grave mistake if we choose programs based on their fit to technology, rather than using technology to effectively deliver the course.

Other suggestions for training in the instructional design area to make better use of technology for meeting client needs included: (a) addressing tips and techniques for developing distance-based material, (b) presenting information in a suitable form for adult learners, (c) adapting learning methods of distance education to job-related information, and (d) web-based course and material development.

***Other technical training.*** Both computer-related and video-conferencing training were suggested; however, they were not elaborated upon. Video-conferencing was highlighted as a potential training tool for staff, not necessarily to be used with clients. As one respondent said,

> I would like to see us try some of our training through video-conferencing. I find I spend a lot of time traveling to and from training courses, conferences, etc. and budgets don't allow for air travel very frequently.

In the computer-related training comments, most respondents concentrated on

learning more about how to use the Internet more effectively including the use of computer conferencing. In addition, knowledge of available software on CD-ROM and other computer-assisted learning programs were suggested.

***Barriers to Using Distance Education***

Along with identifying distance delivery technologies that would be beneficial for use with clients, it is also important to consider the reasons for not using some of these. Barriers included a preference for face-to-face contact, unfamiliarity with the technology or process, lack of access to technology, lack of support, and cost.

***Preference for face-to-face instruction.*** As commented previously, many specialists believed that their clients prefer learning and interacting in a face-to-face environment. The question was asked, "Is there opportunity for effective interaction between the participants?"

One respondent commented,

> Customers prefer flesh n' blood.

Comments indicated that not only do specialists believe that many clients prefer face-to-face, but that as educators or facilitators, they also prefer being face-to-face with their learners. One respondent said,

> I still much prefer the face-to-face delivery of information. I find it is much easier to check the reaction and understanding of the client if you can see or hear their responses. When I have to type out a response it is much more work to provide clarity and deal with all the possible scenarios. Clarity checks and the proper scenario are easily dealt with by asking questions during a face-to-face or phone

discussion.

Another respondent said,

> I personally enjoy contact with clients. In order for clients to make farming practice changes, you must build a trust with them and this comes from direct contact with them and full appreciation for their farming operation and their level of skill and management.

***Unfamiliarity with the technology or process.*** Respondents indicated a lack of acceptance by both clients and staff not only because of a preference for face-to-face interaction, but also because of a lack of willingness to participate for reasons such as lack of understanding, unease with technology, lack of training on the part of specialists, not knowing the "best" or most appropriate means to use technology for a given situation, and unfamiliarity with the capability of the AAFRD internal system or Agri-Ville as to the spectrum of possibilities available.

***Lack of access to technology.*** Both survey and focus group comments suggested that many clients still do not have access to many of the technologies that might otherwise be used for distance delivery. Particularly in rural areas, phone lines may be lacking or of very poor quality. Video-conferencing centers are also not readily available, and where they are available, the cost for use is prohibitive. One respondent commented,

> Believe it or not, not everyone has access to a computer, the Internet, or the required software to utilize distance education.

Some also suggested that AAFRD does not have access to technologies that would enhance the production or introduction of distance delivery. For example,

> Access to the necessary hardware, such as scanners, digital cameras, and software, such as presentation and graphics packages, to enable the development of material for the Internet, multi-media presentations [is limited].

Another said,

> AAFRD is already lagging well behind in this area - our Ropin' the Web site could be considered to be on the "trailing edge" in Internet terms.

***Lack of support.*** Identifying support for distance delivery programming was seen as a critical need if this type of extension is to be introduced. Respondents indicated lack of support in funding, staff time, and internal systems as barriers to using distance education methods. Many specialists do not identify distance delivery as being part of their role. As one respondent said,

> Distance learning programs should be developed at head office where adequate resources are available, not by individuals working with few resources.

Several specialists came back to the question of need. They indicated a lack of specific information on client needs and clearly identified targets for learning courses and packages. Some indicated the desire to conduct a needs assessment specifically for distance delivered programming.

***Cost.*** Cost can refer to a cost in dollars as well as time. Several specialists indicated a lack of time on their part to be able to put materials together, use technology efficiently, find credible and relevant materials for the clients, and to be able to take time away from other activities to devote to a new project. A lack of time from a client viewpoint was also specified. In addition to being stretched in their own time constraints,

one respondent stated that,

> many clients are not able to devote time in small bits. They need to almost be sequestered in order to devote time to a learning project.

A lack of available funds was also seen as a barrier for some specialists. Not only is there a cost in setting up and developing distance delivered course, but there is also a cost in supporting both hardware and software as well as an acceptable cost to clients. As one respondent said,

> What kind of value do you put on these courses to make them acceptable to the client? It is a perception and may not jive with the instructor's perception of the value and the end user's perception.

Another concern stated was,

> organizing a course and having too few people to make it a financial success [is problematic].

### *Opportunities for Self-directed Learning*

To allow RAS specialists to begin experiencing distance delivery, and to have exposure to alternative professional development formats, I explored the current resources available to RAS staff that would help provide them with self-directed learning opportunities.

To expand on the findings from the surveys, focus group and one-on-one interview participants were asked whether any professional development opportunities are currently being explored and how distance education techniques might be incorporated into current professional development programming.

***Current Self-Learning Opportunities***

One interview participant indicated that specific specialist groups are beginning to utilize distance technologies and program opportunities in their self-defined training activities. This person indicated,

> They're looking at a program that's used in the United States for farm management education through the internet. It's like an internet link...they decided that could be a really good avenue and also would be very consistent if they all participated with that program.

The Instructional Design Unit within AAFRD develops a variety of Home Study courses for use by producers; however, RAS staff have typically been involved in developing learning objectives, activities and assisting with piloting projects. New staff in particular may use these programs for self-learning in technical and production areas.

As indicated in the section on context of the respondents, Internet and print materials are used by 100% of specialists to access information for their clients as well as themselves. This is an important resource for self-directed learning.

***Future Self-Learning Opportunities***

The focus group interview and one-on-one interview participants were specifically asked about potential opportunities for staff to take professional development training by distance. The consensus among specialists in the focus group was that "it depends." For example, one participant said,

> It very much depends on what the focus is, whether it's strictly information or whether there's an aspect that has to be interactive and a direct person to person

interaction.

It was also quite clear that specialists value the interaction with their colleagues, as stated by another participant,

> ...what is the purpose for Alberta Agriculture staff going to professional updates? I go to learn more about the content but I also go to talk to the other people that are involved — to interact with them. I suppose you can do that to some extent through distance mediums, but it's easier to do it in person .... So it depends really what the individual purpose is or what they want to happen.

Specialists in the focus group interview were open to trying new methods of training. One stated,

> Probably my strategy would be to identify what kinds of professional training I would want and then try to find out what opportunities are there ... you pick the one format that best gives you what you need. I think there are some opportunities distance related ... there is some great stuff coming out of Australia and Europe and there's no way I, as an individual, would have an opportunity to go, but I may be able to participate in some sort of distance opportunity.

Specialists also discussed some of the barriers to offering distance delivered professional development programming. One barrier centered on the skills of program deliverers in providing face-to-face or distance learning. Focus group participants agreed that there are many professional development opportunities that could be offered by distance, but someone has to take the time and energy to provide it in a different format than what they're used to doing — which is generally face-to-face.

In addition to the barrier of lack of experience and knowledge on the part of deliverers, there is also the lack of experience and knowledge on the part of staff, or the learners. Participants realized that there is a variation in RAS specialist experience with respect to computer use and comfort. With a lack of time, there is a tendency to stick with methods that are proven and familiar.

As with the survey, focus group participants also identified the barriers of technology being unavailable, not working correctly, or not sufficient for the job it needs to perform. Money and time were also important considerations.

On the positive side for working toward distance delivered training, was time management. One participant said,

> If I could be in the office and be able to take something that I don't have to spend hours in a vehicle to get there and the same number of hours back, then that's going to be a better utilization of my time...I can actually do more with my budget and I will be able to serve my clients better.

Participants also identified that there may be a benefit for those in professional organizations who are required to take a specified number of hours or units of professional development.

There was agreement among focus group participants that it would be beneficial to offer some pilot training opportunities and to test them with specialists who are really interested in distance delivery and technology. It was evident from the discussion that,

1. It's really important to make [a distance learning opportunity] a positive experience. If it's a negative one they will never try it again. And they're certainly

not going to promote it to their clients.

2. [A distance learning opportunity] should be tested on the keeners. Because they would be prepared to try a second time. Get [the course or program] refined enough so the middle people take it and then the ones that are really negative.

There may be future opportunities for professional development pilot projects with the introduction of a Knowledge Management Unit. An interview participant noted,

> The purpose of the Knowledge Management Unit will be for sharing information among industries and within the department. This may be an excellent avenue for testing some distance delivery projects for staff. It will be more important to get staff to benefit from the experience of distance delivery and technology than to benefit from the content itself.

Participants in both the focus group and the one-on-one interviews agreed that distance delivery is a new concept that must be cultured. Very likely, opportunities exist to test the various distance delivery approaches with staff; however, there are still many staff and clients who prefer face-to-face learning and the opportunity for interaction with co-workers.

### *Summary*

Chapter four outlined the findings of the research based on the sub-questions posed in the introductory chapter. To set the parameters of the discussion, the context of the respondents was first discussed by describing some demographic information, outlining the experience of respondents with technology, and establishing a sense of the perceived importance and proficiency in extension skills, information technology skills

and skills in determining professional development needs. The majority of respondents were in a production-related discipline, and tended to be either new employees to AAFRD or had long-term service. All reported using both Internet and print material to gather information. In all skills, both the production and business/organization management disciplines rated the importance of skills higher than their perceived proficiency level with the skills.

The first sub-question, "What is the preferred format for professional development programming" was addressed through the survey results and clarified in the focus group interview. Responses indicated that RAS specialists prefer formal learning and hands-on experience, followed by self-learning activities and professional events. The main findings indicated that face-to-face is still the preferred method of both learning and teaching for RAS specialists.

"Which distance education technologies will best meet the needs of RAS specialists for delivering instruction to their clients?" was the second sub-question. Findings focused on the involvement of specialists in developing or delivering distance education programming, technologies they find useful with clients and for their own needs, training required, and barriers to using technologies. The main findings focused on the desire of specialists to determine the needs of their clients before planning or delivering distance programs. It was also evident that they were generally unfamiliar with the potential for distance education in agriculture extension, but that they were interested in what distance technologies were available and how they might be used.

The final sub-question, "What resources are available to RAS staff to provide

opportunities for self-directed learning?" was addressed through deeper questioning in the focus group and one-on-one interviews. Both current opportunities as well as potential for the future of distance delivery of professional development programming were discussed. At least one discipline is taking advantage of American-based distance education opportunities, and there are others available that may be accessible to specialists if the idea were pursued. There was also a clear interest on the part of specialists to find out more about distance education to see if it can be used in some way.

The next Chapter relates the findings of the research to the literature. The research questions will be revisited in light of the findings from the present study and the literature informing those findings.

# Chapter Five
# Discussion

## *Introduction*

Chapter four outlined the findings from the research, using the three sub-questions as the basis for organization: (a) preferred learning strategies, (b) distance education technologies, and (c) opportunities for self-directed learning. The context of the respondents was outlined first, to establish a basis for discussion.

This chapter relates the findings of the research to the literature. The research questions are revisited in light of the findings from the present study and the literature which informs those findings.

## *Preferred Learning Strategies*

The first sub-question addressed in the research was: What is the preferred format for professional development programming? Respondents identified what they believed to be important in terms of a preferred learning environment and well as strategies for meeting their professional development needs.

### *Learning Environment*

As expected, specialists indicated that they wanted training that was relevant to their jobs with facilitators who were knowledgeable, well prepared, and dedicated to meeting the needs of the participants. Facilitators should be available to the learners, they should have quality materials and they should also have identifiable goals and objectives for the training experience. Several comments included statements such as "seminars or other sessions that meet my needs," "highly focused sessions tailored toward the needs of a small group," "courses that meet my needs whether in-house or outside," and "learner

designed."

The literature very strongly supported meeting learner needs as being an important, if not the most important, consideration for program development in face-to-face or distance learning environments.

Coldeway (1986) states,

> Many adult learning theorists and educators view success in individual terms; that is, success is measured and defined by what happens to the individual adult learner. Given that definition, a successful programme or course must be able to recognize the individual's needs, background and ability, and help the learner use those factors to grow and learn. (p. 85)

The very nature of agriculture extension has given specialists a strong foundation in planning programs that meet specific learner needs. The present study supports Griffiths's (1984) assertion that,

> Agricultural extension has long been regarded by adult education authorities as the most effective adult organization in North America. ... By involving their intended audience in the process of identifying problems to be solved, by arranging for learner participation in planning, conducting and evaluating programs, by emphasizing the demonstration method and learning by doing, extension workers have performed in ways that are consistent with learning theories and which have been tested in practice. (Griffith, 1984, p. 19)

Respondents in this study were also in general agreement with Queeney's (1995) definition of needs assessment. Queeney saw needs assessment as a strong indicator of a

successful program with learner needs being a basic ingredient for increasing the chances of success.

> Needs assessment is a decision-making tool for continuing educators' use in identifying the educational activities or programs they should offer to best meet their clients' - and society's - educational needs. Although educational needs assessment, no matter how well conceived and executed, will not guarantee program success, incorporating carefully planned and implemented needs assessment into the program-planning process can substantially reduce uncertainty regarding program appropriateness and viability. (pp. 1-2)

***Strategies***

Strategies for professional development identified by specialists included a variety of responses within the themes of formal training, hands-on experience, self-directed learning opportunities, and professional events. Bates (1995) identified the most important learning modes as direct human contact (face-to-face), text, audio, television and computing.

Both formal training and hands-on experience were identified as face-to-face strategies in the comments. Respondents listed outside agencies and institutions and in-house courses as preferred training methods. Hands-on experience for professional development training includes such activities as working with experts, secondments, co-operative projects, project work, and tours and workshops. Working with mentors was also identified as a desirable method for accomplishing professional development. Another face-to-face strategy for staff professional development was involvement at

professional conferences and events.

The extension training background of many of these specialists came to the forefront in using face-to-face and hands-on teaching and learning techniques. The present research supports Boone's (1989) research distinguishing extension education from other forms of adult education. He describes eight features unique to extension education:

1. Extension is concerned with helping people meet or solve immediate and long-term needs and problems. Efforts are directed toward individual learners, learner groups and learning systems.
2. Extension education creates and nurtures learning that is immediately valued in the context of the learners' everyday lives.
3. Extension education emphasizes the involvement of learners and their leader representatives in the decision making process as it relates to programs and governance.
4. Extension education programs are planned and sequenced to produce or effect desirable changes in the behavioral patterns of learners.
5. Extension programs are dictated by the particular uses to which the learning will be put, and, consequently, are closely related to the environment of the learners.
6. Extensions' programs are conducted close to where learners live and work.
7. A variety of resources and technologies are used in programming. Emphasis is on learning rather than teaching and both professionals and volunteers are used as facilitators and teachers.

8. Extensions' publics participate in its program activities on a volunteer basis. (p. 2)

Specialists repeatedly mentioned that self-directed learning is a preferred format for their professional development. They indicated reading, research, Internet courses, distance education, and self-learning with computer programs as examples of their preferred professional development activities.

Self-directed learning is defined by McCreary (1989) as "collaborative learning with a facilitator who at each point assists, in a subordinate way, the inquiry projects, the independent study, and the experiential learning of the learner" (p. 81). For specialists, the facilitator could be identified as the immediate supervisor, or branch head, who is responsible for assisting each person to identify training needs and plans.

Although self-directed learning may enhance the ability of learners to specifically select content and context according to specific needs, survey respondents identified several barriers to using self-directed learning. One of the barriers identified in the study was the allocation of time for both specialists and clients. Thomson (1993) also discussed the allocation of time as a barrier. His research in correspondence study indicated that "participants found it difficult to allocate time to carry out independent learning. They also found it easy to procrastinate." The allocation of time was a factor stated by several respondents as being an inhibitor for taking training, and some indicated that training in distance education technologies was not a priority.

### *Distance Education Technologies*

The second research sub-question addressed was: Which distance education technologies will best meet the needs of RAS specialists for delivering instruction to their

clients? The purpose was to get some sense of the technologies that staff would use and technologies that staff believe are available to their clients. The findings related to this question focus around four topic areas: (a) involvement of specialists in developing or delivering distance education programming, (b) useful technologies, (c) training in technologies needed to take advantage of opportunities with clients, and (d) barriers to using distance education.

***Involvement of Specialists***

Although less than 30% of specialists reported ever being part of a distance education course as a developer or facilitator, specialists did suggest that they might become involved in student support and networking, marketing, development, and delivery. Some also indicated that there should be no role for specialists in distance delivery.

Although these findings are specific to the group of Alberta Agriculture specialists who responded to the survey, the literature does suggest that distance education practices are becoming a more accepted, and necessary, part of an extension role. Research conducted at a Texas agricultural research and experiment station indicated that "the demand for information from extension staff is tremendous and it is becoming more evident that they are not capable of providing all of the information requested by their clients using traditional contact methods such as farm visits, group meetings, and newsletters" (Hiel & Herrington, 1997, p. 2).

It is also important to note, however, that distance techniques may be best used to enhance program delivery. For example, Trede and Whitaker (1998) state

> The Internet and the World Wide Web (WWW) make the latest information available via computers and modems. Even though meetings and on-site instruction have been long time favorites of extension, these face-to-face contacts as a primary delivery method have diminished. However, there will always be a need for personal interaction. New delivery methods will serve as a supplement to, not a replacement for, proven existing methods.
>
> (p. 4)

Survey findings also indicated that a variety of methods is important, with educational technologies being used to enhance the process, not replace it.

***Useful Technologies***

Respondents were asked to identify specific technologies that would be useful for delivering programming to clients. Responses were categorized into the following groupings: print-based; telephone and facsimile; video, radio and television; internet and e-mail; computer software; satellite conferencing; and multi-media.

The literature discussed these same technologies as being useful in extension education for reaching clients. "The increasing use of communication technologies such as fax and e-mail by extension clientele has opened a new avenue to meet client needs. These communication technologies give extension the opportunity to be more reactive, efficient, and timely in meeting clientele needs" (Siegrist, Labarge, & Prochaska, 1998, p. 1). Hiel and Herrington (1997) state, "Video-conferencing and other distance learning technologies can facilitate and enhance the work carried out by scientists, professors, and other extension personnel....Tools of distance education can allow a broader audience to

be reached with a more direct flow of information" (p. 3).

In a recent western Canadian benchmark survey of farmers and ranchers, Garvin and Associates (1998) found that the top three preferred means of gathering information were written material, video tapes and fax bulletins. They also found that

> the interest level in using the Internet has increased significantly over the last two years .... The percentage of Alberta farms/ranches with an Internet connection has increased dramatically from 10% in 1986 to 34% in 1998. The percentage could reach 60% in the next two years if all intentions to obtain an Internet connection are followed through. (p. B-2)

Specialists did note that some clients have limited access to technologies such as the Internet because of their rural location. Although this is becoming less of a barrier, the literature did tend to agree that there are some factors that inhibit the use of such technologies. For example, Samson (1998) noted

> In some rural areas, factors immediately external to Internet technology have hampered successful use of the WWW. Reliability of telephone service in many rural areas is not at the same level of support that is found with their urban counterparts. Unexpected interruptions of telephone service while connected to an Internet provider can be frustrating to a computer user, especially to one who is a novice to Internet technology. Another problem in many impoverished rural areas is the lack of, or limited access to, up-to-date computer technology such as fast modems and central processor units (CPUs). (p. 2)

***Need for Training in Technologies***

To be able to utilize the technologies available for distance delivery to clients, specialists were asked to identify their training needs in distance delivery techniques and technologies. Major themes were: (a) technology availability, (b) how to use technology, (c) facilitation skills, (d) instructional design, and (e) other technical training including computer-related and video-conferencing training.

The literature supports the notion that there are new skills and techniques that must be learned in order to make distance delivery more successful. "Adequate training prior to distance teaching and continuing support throughout the delivery process are the most effective and efficient methods for ensuring long-term instructional success in distance education" (Willis, 1993, p. 37). It is important that instructors experience hands-on training with the technologies they will be teaching and using in the teaching process. There are also issues of technical considerations and technical support on the part of the instructional organization (Martinez & Sweger, 1996, p. 30). Hopey and Ginsberg (1996) state,

> An immediate issue for using the Internet is professional development for those who will be using it as an instructional tool. In educational organizations, instructors will need ongoing training in new methods and advanced skills. They will need to change their role from one of teacher in the traditional sense, to a "facilitator, motivator, and validator of knowledge." (p. 23)

Although Miller and Carr (1997) researched the information and training needs of agricultural faculty, the concepts are similar to those related to extension education. Their

findings indicated that teaching techniques for distance education was the only topic that received a very high priority rating. Faculty were most interested in teaching techniques, models of effective teaching, principles of teaching and designing instruction. They cite Willis (1994) who stated that faculty who teach at a distance must:

> ...develop an understanding of the characteristics and needs of distant students with the first-hand experience and limited, if any, face-to-face contact; adapt teaching styles taking into consideration the needs and expectations of multiple, often diverse audiences; develop a working understanding of delivery technology, while remaining focused on their teaching role; and function effectively as a skilled facilitator as well as a content provider. (p. 2)

One aspect of the Miller and Carr (1997) research that disagreed with respondents' comments in this study was the importance of understanding distance education and its potential. Several Alberta Agriculture specialists responded that they were unsure of what technologies were available and what the potential was. They wanted very basic training in this type of information. The faculty who responded to the Miller and Carr survey rated this topic as relatively low. It was assumed that "Agricultural faculty who responded to this survey have likely developed an interest in and basic understanding of distance education. They need not be further sold on its virtues and potentialities" (p. 8).

Several literature sources supported the study with respect to the need for instructor training. For example, Willis (1993) states that "Adequate training prior to teaching and continuing support throughout the delivery process are the most effective

and efficient methods for ensuring long-term instructional success in distance education" (p. 37). Hopey and Ginsburg (1996) and Martinez & Sweger (1996) agreed that hands-on training for instructors in using distance technologies is important.

***Barriers to Using Distance Education***

Along with identifying distance delivery technologies that would be beneficial for use with clients, it is also important to consider the reasons for not using some of these. Barriers included a preference for face-to-face contact, unfamiliarity with the technology or process, lack of access to technology, lack of support, and cost.

The literature concurred with these findings, with technical difficulties mentioned most frequently. An additional barrier that was discussed from the viewpoint of the instructor was the amount of time required to facilitate a distance delivered program.

Ridley and Sammour (1996) and Kearsley, Lynch and Wizer (1995) found that students generally agreed that online learning enhanced communication and collaboration; however, they disliked the problems associated with telecommunications hardware and software. Lacina-Gifford and Kher-Durlabhji (1996) agreed with these findings in their research stating that, "Technology-related breakdowns are sure to happen, and there needs to be a plan in place to address them. Learner success is affected by their previous knowledge of and familiarity with telecommunications software along with a working understanding of the various protocols" (p. 94).

In the farming and ranching sector, information gathering is still done predominantly with traditional techniques. "A lack of time continues to be the dominant reason why a producer has not taken advantage of the programs/resources made available.

Lack of interest is also relatively common" (Garvin & Associates, 1998, p. B-3). In addition, the lack of technology in some rural areas has hampered the use of Internet (Samson, 1998). Freeman et al. (1997) state:

> at present much of extension's internal and external audience is struggling to keep up with the rapid change in information technology. If on-line publications are to realize their potential as a viable alternative to paper-based resources, significant efforts must be made to publicize their availability and location, and to convince target audiences of the practicality and efficiency of obtaining information and resource materials on the WWW. (p. 18)

Although several specialists indicated that their learning preference is face-to-face, a study done by Lippert et al. (1998) showed that there is potential for change. The question addressed in their research with in-service training of extension agents was "whether a high tech approach that has no face-to-face interaction could be a feasible method of training with a group of professionals who have traditionally depended on a personable approach of communication" (p. 18). Findings indicated that the participants seemed to enjoy the novelty of this form of communication, particularly after acquiring more advanced internet skills.

Shobe (1986) described seven key factors identified by research as determining the success or failure of technological innovations for distance education:

1. Responsiveness to learner needs - formal and informal educational needs must be addressed directly by DE agencies.
2. Program quality - excellence in program design, media selection and media

production must accompany excellence of the technical delivery system.

3. Interactive components - the interactive capability of an instructional system is at least as important as the multimedia capability of the distribution/broadcast technologies used.
4. Reliability of the system - simple instructions and simple activities should allow learners and instructors to use the system effectively.
5. Cost and accessability - telecommunications costs are a major limiting factor in interactive technology-based distance education.
6. Student support systems - the administrative support systems of educational institutions rarely reflect the time-lines and lifestyles of off-campus learners.
7. Institutional commitment - Institutions which would use the new technologies to serve both on-campus and off-campus learners must make an early and continuing commitment to a long-range transition program if they are to be successful. (pp. 229-230)

### *Opportunities for Self-directed Learning*

To allow RAS specialists to begin experiencing distance delivery, and to have exposure to alternative professional development formats, I explored the current resources available to RAS staff that would help provide them with self-directed learning opportunities. I also questioned the focus group and one-on-one interview participants about professional development opportunity areas currently being explored and how distance education techniques might be incorporated into professional development programming.

One interview participant indicated that specific specialist groups are beginning to utilize distance technologies and program opportunities in their self-defined training activities. The literature (e.g., Vitzthum & Schylze, 1994; Miller, 1995; and Miller and King, 1994) suggests that there are several post-secondary institutions in the United States providing distance learning programs. Agriculture extension is closely connected to the land-grant college system in the U.S., so many of the post-secondary institutions provide in-service training to extension agents. Canadian institutions such as the University of Guelph, Athabasca University, and University of Saskatchewan offer distance delivered courses, but not necessarily in the area of agricultural production. Distance delivered in-service opportunities from the United States and Canada may also be available to Alberta Agriculture specialists.

Through examination of the literature, the following American universities seem to be the leaders in agriculture-related distance education: Purdue, Iowa State, North Carolina State, Ohio State and Kansas State.

On the positive side for working toward distance delivered training, was time management. Some specialists identified time on the road and in meetings as time that might be better spent in the office. Lippert et al. (1998) concluded that "the Internet approach to instruction has tremendous potential for training county extension agents. Agents can log-on to the computer as their schedules permit. ...Internet training eliminates the need to travel to another location ... thus saving time and money (p. 3).

There was agreement among focus group participants that it would be beneficial to offer some pilot training opportunities and to test them with specialists who are really

interested in distance delivery and technology. It was evident from the discussion that making a distance learning opportunity a positive experience is important. Lippert et al. (1998) concur, stating that "to make a successful training program, it was important to choose a topic of wide interest, to create an appealing and well designed web page, and ensure that the users would encounter as few problems as possible utilizing the Internet" (p. 7).

Participants in both the focus group and the one-on-one interviews agreed that distance delivery is a new concept that must be cultured. Very likely, opportunities exist to test the various distance delivery approaches with staff; however, there are still many staff and clients who prefer face-to-face learning and the opportunity for interaction with co-workers. The greatest barrier to moving toward distance delivered in-service for specialists, with an ultimate goal of using distance technologies and techniques with clients, is the historically strong connection to face-to-face and hands-on teaching and learning. It will take a significant paradigm shift for specialists to understand whether or not these same philosophies can be adapted in a distance environment.

### *Summary*

Chapter five discussed the findings of the research relative to the literature. The organization of the chapter was based on the sub-questions posed in chapter one. Most of the findings from the present study supported what was reported in the literature. These findings included:

1. Meeting learner needs is an important, if not the most important, consideration for program development in face-to-face or distance learning environments.

2. Interaction in a learning environment is important in facilitating the teaching-learning process.
3. Both learners and facilitators find it difficult to allocate time to independent learning.
4. Distance techniques may be useful to enhance educational program delivery, but are not a replacement for existing methods.
5. Some technologies may be more useful than others for specialists to be more reactive, efficient, and timely in meeting client needs.
6. Many rural dwellers still have limited access to technology.
7. Instructors or facilitators must have adequate training and hands-on experience to help ensure instructional success in distance education.
8. Technology breakdowns are a barrier to using distance education. There must be a strong support system for both learners and instructors.
9. Allocation of time is a barrier to using distance education, from both a learner and instructor viewpoint.
10. Distance education opportunities for both specialists and clients currently exist.

Only one finding did not support the existing literature. Namely, the respondents in this study, even those not familiar with the technology used for the delivery of distance education, believed that it was important for them to understand distance education and its potential.

Chapter six provides an overview of the thesis and outlines conclusions and recommendations emerging from the research. It provides some suggestions for AAFRD

management to consider when planning specialist training opportunities and for providing some incentive for RAS staff to develop distance-related materials for their own disciplines and, in time, for their clients.

# Chapter Six
# Overview, Conclusions and Recommendations

## *Introduction*

This chapter provides an overview of the study, including a summary of the research question and sub-questions, methodology of the research, and a brief description of the findings. The findings are used as the basis for drawing conclusions about the research. On the basis of the conclusions reached, recommendations are made addressing practice (e.g., recommendations for AAFRD managers, specialists and human resources) and research (e.g., recommendations for further research). This chapter concludes with a personal reflections section in which I hope to provide insights to other graduate students beginning on their research journey.

## *Overview of the Research*

### *Purpose*

The purpose of this research was to identify training and development needs for Alberta Agriculture Regional Advisory Services (RAS) staff as they move toward providing services to clients by distance delivery. The research problem addressed was: What are the professional development needs of Alberta Agriculture Regional Advisory Services staff in developing and facilitating distance education opportunities for customers?

Three sub-questions were addressed from the perspective of RAS staff to help explore the research question:

1. What is the preferred format for professional development programming?
2. Which distance education technologies will best meet their needs for delivering

instruction to their clients?

3. What resources are available to RAS staff to provide opportunities for self-directed learning?

***Methodology***

The three qualitative methods of survey, focus group interview and one-on-one interviews were used to collect data to address the research question and sub-questions. Quantitative data were also collected with the survey. Of the 134 individuals surveyed, 91 responded, yielding a 68% response rate. Five specialists took part in the focus group and three staff were interviewed one-on-one. Trustworthiness in the study was addressed using Guba's (1981) criteria for: credibility, transferability, dependability and confirmability. Methods used to help ensure trustworthiness were: peer debriefing, triangulation, member checks, theoretical/purposive sampling, thick description, and an audit.

***Findings***

The findings included an overview of the context of the participants to establish a basis for discussion. Data collected centered on the following issues: (a) specialist roles, (b) technologies used to gather information for themselves and clients, and (c) perceived importance and proficiency of extension skills, information technology skills, and determining professional development needs.

In addition to what was found regarding the context of the respondents, the main findings were organized around the three sub-questions, namely: (a) preferred learning strategies, (b) distance education technologies, and (c) opportunities for self-directed

learning.

***Preferred learning strategies.*** The first sub-question addressed in the research was: *"What is the preferred format for professional development programming?"* Respondents indicated that they wanted training that was relevant to their jobs with facilitators who were knowledgeable, well prepared, and dedicated to the needs of the participants. Preferred methods of professional development training identified by respondents included: seeking help from outside agencies and institutions, in-house courses, mentors, secondments, and professional conferences. Self-directed learning was also listed, which included such activities as reading, internet, and other distance delivered courses.

***Distance education technologies.*** The second research sub-question addressed was: *"Which distance education technologies will best meet the needs of RAS specialists for delivering instruction to their clients?"* Although less than 30 percent of specialists who responded reported ever being part of a distance education course as a developer or facilitator, respondents indicated that they may consider future involvement in the following capacities: (a) tutor or consultant, (b) performing needs assessment and evaluation, (c) marketing programs, (d) developing ideas and materials, and (e) assisting with facilitating and instructing.

Respondents were asked to identify specific technologies that would be useful for delivering programming to clients. Several comments suggested that some specialists are not particularly aware of all of the opportunities or technologies available for distance delivery. There were several comments stating that an "interactive" opportunity is

important, as well as the comments that "most people still prefer to see and know the person they receive information from."

To be able to utilize the technologies available for distance delivery to clients, specialists were asked to identify their training needs in distance delivery techniques and technologies. Many specialists responded that a clearer understanding of the technologies and distance delivery options available to them would be useful. As well, comments related to the need for RAS specialist training to be focused on client needs. Other suggestions for future RAS specialist learning included how to: (a) use new technologies, (b) facilitate internet discussions and communicating with clients on-line, (c) assess client needs, (d) use technology as a method of meeting learning objectives, and (e) use the internet more effectively including the use of computer conferencing.

Specialists were asked to identify barriers inhibiting them from using distance education technologies either for their own professional growth or for their clients' growth. Many specialists believed that clients prefer learning and interacting in a face-to-face environment. In addition, many respondents indicated that they prefer interacting face-to-face with their clients. Respondents also listed the following issues as barriers to using distance education technologies: (a) lack of understanding, (b) uneasiness with technology, (c) lack of training for specialists, (d) lack of access to many technologies for both specialists and clients, (e) lack of time for both specialists and clients, (f) lack of funding from the department to try new technologies, and (g) lack of support from upper management to assist with development and implementation of both training opportunities and programs.

***Opportunities for self-directed learning.*** Focus group and one-on-one interview participants were asked whether any professional development opportunities are currently being explored and how distance education techniques might be incorporated into current professional development programming. The findings indicated that some specific specialist groups are beginning to utilize distance technologies and program opportunities in their self-defined training activities. In considering future oppórtunities, participants indicated that the technologies, or training methods, used need to be suited to the topic. Very likely, opportunities exist to test the various distance delivery approaches with staff; however, there are still many staff and clients who prefer face-to-face and the opportunity for interaction with co-workers.

## *Conclusions*

In this section, the findings are interpreted to provide some direction for human resources personnel as well as those in the department who are responsible for providing training opportunities for staff. The following topics will be addressed: (a) formats for professional development training, (b) training priorities for specialists, and (c) possible future directions for professional development in Alberta Agriculture.

### *Formats for Professional Development Training*

Support for the importance of learner needs and the involvement of the learner in developing program objectives is very strong in the literature. The field of adult education, in particular, is partially defined by the extent of learner participation in the learning process.

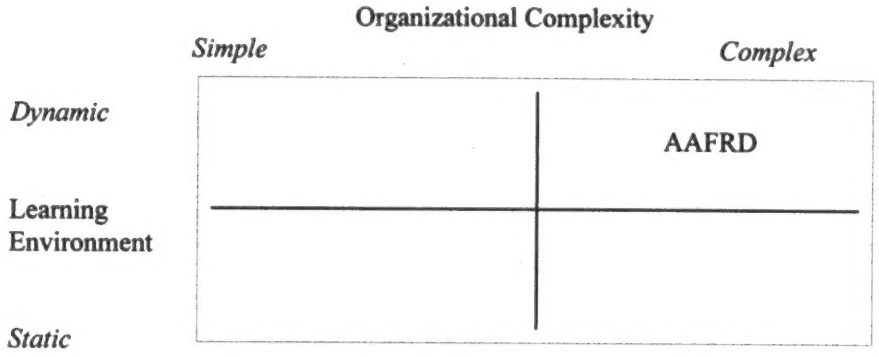
Hoy and Miskel (1996) studied the effect of environmental elements on

organizational structures. They concluded that when the environment is simple, the organization also tends to be simple. It is more formal and centralized with standard procedures and few departments. When the environment becomes more complex, the organization becomes decentralized and more informal with a greater number of departments. Hoy and Miskel's theory can also be related to learning environments and organizations.

Participants in this research indicated that they wanted training that was relevant to their jobs with facilitators who were knowledgeable, well prepared, and dedicated to the needs of the participants. AAFRD is a complex organization with many departments (i.e., divisions and branches) and it is very difficult to achieve standard communication and operational procedures. The learning environment, particularly for RAS specialists is very dynamic. There are constant changes in technologies and practices in the agriculture industry, and each specialist requires slightly different professional development opportunities because of his or her specialty and the location of the position. Figure 1 illustrates a model for environmental stability and organizational complexity.

**Figure 1**

**Model for Environmental Stability and Organizational Complexity**




In a complex organization such as AAFRD, staff must take more initiative to identify their own professional development needs and the opportunities to meet those needs. With the large variety of sources for professional development, it will also be important for managers and human resources personnel to be more aware of the identified needs of individual staff in their jobs and the availability of training opportunities both within the department and outside. It was not evident from the research whether or not specialists perceived that their training needs were being met, but it was evident that they perceive their needs as being important. Perhaps there is opportunity to improve or expand upon the needs assessment process for professional development.

There are numerous methods of professional development training from formal, face-to-face programs to very informal, self-learning opportunities. Specialists identified courses from outside agencies and institutions as well as in-house courses as being preferred methods of training. It seems that extension specialists with AAFRD continue

to be quite traditional in their teaching and learning preference of face-to-face interaction. Mentors and secondments were also mentioned frequently. Opportunities for this type of experiential training may be beneficial for staff who are considering expanding their skills into less common interests such as distance education, management, and more specialized disciplines.

Self-directed learning was mentioned by respondents as a way to expand their knowledge and skills in a variety of ways that might include reading, internet research and personal communications with others. This is a very broad topic that is difficult to define; however, it seems that many learning opportunities are not considered because they are not standardized. There is no one person or part of the department that has responsibility for assisting with the development of personal training plans, nor is there a reliable or complete source of how to locate resources for self-directed learning.

***Training Priorities for Specialists***

Specialists indicated that they want training relevant to the job, and that they don't have extra time to take training on subjects that may not be directly applicable. Since distance education was not seen as a priority by most specialists, any training in distance delivery techniques or technologies would tend to be overlooked for other topics.

There was, however, interest in learning more about what opportunities are available and how distance technologies might be incorporated into the specialist role. It seems that many specialists are not familiar with distance education due to a lack of experience and exposure. One opportunity that may coincide with skills that specialists perceive as being important, would be training on how to use e-mail more effectively for

providing information and services to clients. In addition, skills in using the internet were identified as specialist needs for the job.

### *Distance Education Opportunities for RAS Specialists*

Some specialist disciplines are already taking advantage of distance delivered training from outside of Alberta. There was some interest from specialists for knowing what types of opportunities are available. At present, there is no central source of training information beyond what is offered by AAFRD for staff. Perhaps there is an opportunity for a library or human resources project to identify distance training opportunities for a variety of disciplines.

Respondents identified several barriers that inhibited them from using distance education technologies. These included a lack of understanding, unease with the technology, lack of training available, and lack of access to technologies. Many of these barriers might be overcome with greater opportunities to experience distance delivery in staff development or staff meetings. AAFRD staff all have access to e-mail and internet, as well as conference telephones. These technologies might provide a beginning to experimentation for future training potential.

## *Recommendations*

### *Recommendations for Practice*

The field of distance education is unfamiliar in professional development programming in AAFRD; however, distance delivery is being used by many large companies and post-secondary institutions to reach people who do not have direct access to training or who wish to take training from another provider. There are opportunities for

further study of the use of distance education techniques and technologies in AAFRD and agriculture extension. The following recommendations stem from the literature review and the results of this study:

1. The involvement of staff in developing their professional development plans should be further explored to help ensure that specific needs are met. Training for staff in identifying and working with supervisors and colleagues on developing a training plan may provide an opportunity for staff to feel more confident in their training choices. Staff also need to feel confident in their interpretation of the department business plan and further identifying professional development needs so that they can contribute to the goals.
2. Both production and management specialists should be encouraged to identify a variety of training methods that might be used to address identified professional development topics. For example, a specialist in business development who has identified alternative livestock opportunities as a topic area needed in his or her professional development program may choose to try a secondment, attendance an industry conference and individual research to gain skills and knowledge. Each of these methods should be evaluated for its merit for the topic area, discipline and specialist.
3. Distance delivery could be offered as an alternative to face-to-face delivery for those staff wishing to experiment with technology and methodology. There are a variety of sources for distance delivered programs, and staff may also wish to develop a self-learning plan to learn about a specific topic.

4. An inventory of professional development opportunities outside of the department might be developed to help both production and management specialists become more aware of what is available. The Ropin' the Web page could have an agriculture-related training site that indicates sources of training opportunities available including upcoming industry conferences, courses at post-secondary institutions and through private organizations. This inventory would provide staff with options to choose from in developing their personal training plans.
5. Pilot projects might be established with the assistance of Home Study or Knowledge Management to provide opportunities for AAFRD staff wanting to develop skills in distance delivery. Pilot project proposals would need to be developed by a discipline group or a group of staff with common professional development needs. The resulting project would need to be of use to others once it is piloted. For example, an entrepreneurial training program could be piloted by a group of specialists with an interest in new ventures, and the resulting program could be used with other staff, clients, and partners.
6. Opportunities to use distance delivery tools in a learning environment would contribute toward overcoming some of the barriers identified by respondents in this study. Lack of understanding, uneasiness with technology, and lack of training for specialists could be addressed by providing greater opportunities for alternative training methods and by a positive and supportive management team. The Knowledge Management branch may have the strongest influence in being able to provide opportunities. This branch may also be the key to addressing two

additional barriers that were identified: lack of funding to try new technologies and lack of support from upper management.

7. The issue of a lack of time to learn about distance technologies, or to try a variety of professional development methods is a difficult barrier to address. The idea of secondments was noted by several respondents. A secondment offers an opportunity for hands-on learning in an environment that is different than the "regular" job of a staff member. The opportunity allows a person to be immersed in a new situation where learning can become the focus.

***Recommendations for Theory***

The Hoy and Miskel (1996) framework is a strong foundation for the beginning of additional research in the relationships between the complexity of organizations and the dynamics of a learning environment. AAFRD is a complex organization with a dynamic learning environment. As such, there are considerations for professional development training such as the involvement of individual staff in planning their professional development programming.

There are three other combinations of organizations that could be studied further:

1. What are the issues and considerations in a dynamic learning environment within a simple organization?
2. What are the issues and considerations in a static learning environment within a complex organization?
3. What are the issues and considerations in a static learning environment within a simple organization?

### *Summary*

This study was conducted to provide information and feedback to human resources and management on the need for professional development training for RAS specialists in distance delivery techniques. It appears that specialists do not perceive distance education as being an important part of their jobs because of a lack of acceptance for this method by either themselves or their clients. There are, however, some specialists who believe that there are opportunities to begin using distance delivery for professional development opportunities, which may eventually lead to a greater use with clients.

### *Personal Reflections*

In making the decision to pursue a Master of Education degree, it was important for me to make the research something practical and useful. Although I had submitted a proposal and worked through the pilot studies, I chose to change the focus of the research when I accepted a full-time position with AAFRD. This required an entirely new proposal, a new advisor and a new committee – all very positive changes.

I am still a great supporter of doing research for a specific purpose, not just for the sake of research. This project was supported by many levels of AAFRD staff from specialists in the field to Assistant Deputy Minister. That support was crucial to the success of the project and to my motivation in completing it.

In planning the methods and developing the data collection tools, I chose to involve a small group of colleagues that I called the core committee. They served as my internal advisors on issues such as the best format for a survey, participants for the focus group and interviews, and pilot testers for the survey. They were able to ask pertinent

questions from another point of view, which was important since I was no longer in the university environment with fellow students.

Using technology to conduct the data collection was a challenge, as it always seems to be. The tape recording device used for the focus group and interviews was of very poor quality. In hindsight, hiring a stenographer to act as a manual recorder and getting a high quality tape recorder would have been worth the expense. The technology used for survey distribution was not without its glitches as well. Due to the variety of printers in each office, many specialists had difficulty printing the survey in a legible format if they chose to do it in hard copy. Others indicated that they could not print the survey at all because of the hardware available to them. Although I still believe that our department e-mail system was the most efficient method of survey distribution, I would find greater powers to authorize the Information Technology division of our department to develop an on-line questionnaire that was more user-friendly. This was the original plan; however, next time I wouldn't give up so easily.

The writing of the paper was certainly the most time-consuming, and I suggest that there are some helpful strategies for getting it done. In my mind, I believe that by entering a graduate program with a solid research project idea, the entire study could be completed quite easily and efficiently if using it as the core material for the research courses and electives. This is a difficult challenge, as there are always new and exciting topics and ideas that emerge during the duration of the program.

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# APPENDICES

**Appendix A - Introductory Letter**

**Appendix B - Survey Cover Letter and Survey**

**Appendix C - Focus Group Questions**

**Appendix D - Consent Form**

## Appendix A
## Introductory Letter

Dear Colleague:

As you may know, I recently joined Alberta Agriculture as the Rural Development Specialist - Business in the Hanna District Office. Since leaving the department two years ago, I've been busy doing contract work and completing a Master of Education degree at the University of Alberta in Adult Education.

The final requirement for completion of my degree is the research and thesis. I am very interested in distance education technologies, but realize that there is still a lot for us as staff to learn about how to use them for providing educational opportunities to our customers.

My project is a needs assessment of RAS Specialists for professional development in providing distance delivered programming.

I am asking all field specialists to complete a survey that will take about 15 minutes. You will receive the survey by **December 7**, and I hope you will be able to take some time out of your busy schedules to return it to me by **December 18**. Your responses will be kept confidential. The results of the survey will be sent to you before the final thesis document is submitted.

The second phase of the study includes focus group and individual interviews. You may be asked to participate in one one-hour meeting to discuss issues that came from the surveys.

Participation in this study is completely voluntary. You can withdraw at any time without repercussions.

I am conducting this research under the supervision of Dr. Joe da Costa, Education Policy Studies, University of Alberta. My department contacts are Alan Hall, Regional Director in Red Deer, and Les Lyster, ADM Field Services. Should you have any questions or concerns, please feel free to contact me at 403-854-5500 or e-mail linda.hawk@agric.gov.ab.ca. Dr. da Costa can be e-mailed at jose.da.costa@ualberta.ca.

I thank you in advance for your participation in this research, and I hope your own projects are going well.

Sincerely,

Linda Hawk
Rural Development Specialist - Business
Hanna, AB
(403) 854-5500

## Appendix B
## Survey Cover Letter and Survey

Linda Hawk
Rural Development Specialist - Business
Box 349, Hanna AB T0J 1P0

December 7, 1998

Dear Colleague,

As I mentioned in my correspondence of November 27, I am conducting a needs assessment of RAS specialists. This survey is part of my M.Ed. research project at the University of Alberta in the Adult Education program. The project is expected to further understanding of the professional development needs of Alberta Agriculture field specialists in the area of developing and delivering education through distance education technologies.

I would greatly appreciate it if you would take 15-20 minutes of your time to answer the survey.

You can fill out the survey by "replying with history" directly in Lotus Notes; or, print the survey and return it in hard copy to me at the Hanna District Office. Your responses will not be anonymous, but be assured that they will be kept confidential. No one has access to my email, and I will not be using names, positions, or office location to attach to any comments.

By filling out and returning the survey, I will assume that you are giving your informed consent to participating in this research project.

- You understand that your participation is voluntary
- The general plan of the this study has been outlined to you, including any possible known risks
- You understand that the results of this research may be published or reported, but that your name, position or location will not be associated in any way with any findings.
- You understand that your comments will be confidential, and that you will have the opportunity to review the survey results before any publishing or reporting of the findings.

Thank you very much for your participation and support of this project!

Linda Hawk
Rural Development Specialist-Business

# Distance Education in Agriculture Extension: A Needs Assessment for Alberta Agriculture Staff Development

## Regional Advisory Services Specialist Survey

**Instructions:** This survey is part of a Masters Thesis project. Please read the attached introductory letter before you begin to answer the survey. Right click on the icon and choose "view".

Survey Introduction

The questions in this survey are related to your knowledge and skills in distance education techniques and technologies. Please return by ***December 18, 1998.***

The easiest way to respond is to type directly into this Email and send it back to me. Just follow these quick suggestions:

- From the Lotus Notes menu at the top of your screen, click on "Reply With History."
- For the multiple choice questions, type an "x" in front of the ❑ and ☒❑ will appear. You can leave it this way, or delete the second box.
- For the open ended questions, type your responses directly into the text boxes provided below each question. The cell will expand automatically as you type.
- When you're finished, click on "Send."

If you prefer, you can print this message, respond on the hard copy, and return it to:

Linda Hawk, RDS-Business
Hanna District Office
Box 349, Hanna, AB T0J 1P0

If you would like the results of this research, please contact me at the above address or email.

Thank you for taking the time to complete this survey!

## Part A: Demographics

How long have you been in agriculture extension ("x" by one choice)

- ☐ 0-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ Over 20 years

Check the technologies that you have used for information gathering for yourself or your customers: ("x" by all that apply)

- ☐ Computer: CD-ROM
- ☐ Computer: Internet
- ☐ Computer: Other software
- ☐ Print material
- ☐ Audio material (i.e., cassette tapes, radio programs)
- ☐ Video, television, film
- ☐ Other

How would you define your specialty area in Alberta Agriculture? (Choose one)

- ☐ Production
- ☐ Business/Organization Management

Have you ever been part of a distance course as a developer or facilitator?

- ☐ Yes
- ☐ No

If so, what made it successful?

| |
|---|
| |

Have you ever been part of a distance course as a learner?

- ☐ Yes
- ☐ No

If so, what made it successful?

| |
|---|
| |

## Part B: Extension and Distance Education Activities

For each of the following extension-related skills, please make two judgements. First, rate the importance of each skill to your current job requirements by putting an "x" under a number from 0 to 5
**0 = not at all important; 5 = very important**

Second, indicate your current level of proficiency in each area
**0 = none at all; 5 = expert**

| SKILL | IMPORTANCE<br>Importance of the activity to the job | | | | | | PROFICIENCY<br>Your proficiency in current job | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 0 | 1 | 2 | 3 | 4 | 5 |
| **Needs Assessment:** Working with customers and other professionals to identify educational needs. | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| **Setting Objectives:** Identifying expected results from programming. | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| **Determining Resources:** Identifying information sources that will help meet the objectives. | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| **Program Design:** Choosing methods and resources that will achieve the learning objectives of your customers over the long term. | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| **Evaluation:** Determining the value of programs/activities by collecting evidence of results achieved. | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| **Distance Delivery:** Meeting customer needs through methods other than face-to-face (i.e., email, internet, video) | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Information Technology Skills:** | | | | | | | | | | | | |
| Doing an Internet search | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Using a word processing program | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| HTML coding | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Using e-mail | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Attaching documents to email | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Using presentation software | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Facilitating Computer Conferencing | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Using video-conferencing technology | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| **Professional Development:** | | | | | | | | | | | | |
| Identifying your own professional development needs | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Setting personal learning objectives | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Identifying appropriate methods to achieve your objectives | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Completing independent learning activities | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Evaluating your performance | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

## Part C: Open-Ended Questions

**Training and development needs can be met through a variety of methods: in-house courses (face-to-face), outside agencies and institutes, secondments, certificate/degree programs, mentors, self-learning activities, internet courses, distance-delivered programs, etc. Please indicate up to three of your most preferred ways to meet your training and development needs for your job.**

**Describe what role, if any, you might have in distance delivery of educational programs to your customers:**

**What distance education technologies would be most useful to help you deliver programming to your customers?**

**Please identify any professional development/training in distance education technologies and techniques that would help you do your job better:**

**What are the barriers for you in offering distance education programming to your customers?**

**Other Comments:**

**Thank you for your time and energy!**

Linda Hawk
Rural Development Specialist - Business
Hanna, AB
(403) 854-5500

## Appendix C
## Focus Group Discussion Questions

1. How would you define "distance education?"
2. How would you define "extension?"
3. How would you differentiate information and education?
4. Do you think that there is opportunity for staff to do professional training by distance?
5. What kinds of opportunities might there be for distance delivered professional development in Alberta Agriculture?
6. What are some of the barriers within Alberta Agriculture to using distance technologies for professional development?
7. How might those barriers be overcome?
8. What would be the benefits of providing professional development opportunities through distance delivery?
9. Should the department choose to offer some Distance Education programs for clients, how many clients do you think are willing and able to participate?
10. Who might the target audiences be?
11. How might the department provide opportunities for those staff who wish to use distance technologies and distance learning for their own professional development or for use with clients?
12. How will the late majority or laggards adopt to these new methods?

## Appendix D
## Consent Form for Research Participation

I hereby consent to participate in the research project entitled "Distance Education in Agriculture Extension: A Needs Assessment for Alberta Agriculture Staff Development" conducted by Linda Hawk under the supervision of Dr. Jose da Costa at the University of Alberta.

The research project is expected to further understanding of the professional development needs of Alberta Agriculture field specialists in the area of developing and delivering education through distance education technologies.

- I understand that my participation is voluntary
- The general plan of the this study has been outlined to me, including any possible known risks
- I understand that the results of this research may be published or reported, but that my name or position will not be associated in any way with any findings.
- I understand that my comments will be confidential, and that I will have the opportunity to review them before any publishing or reporting of the findings.

_____ _____

Date Signature